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Synergistic Analgesia in Head Surgery With Special Reference to Novocain, Magnesium Sulphate and Morphin

JAMES J. KING, A.B., M.D.
New York

The value of magnesium sulphate and morphin as a synergist in general anesthesia was called to my attention first by Dr. James T. Gwathmey in 1921. As a result, I immediately began clinical tests with the combination in conjunction with local anesthesia. After numerous clinical observations Gwathmey established the fact that morphin may be given in a 25 or 50 per cent solution of chemically pure magnesium sulphate instead of plain water and that in this combination the therapeutic value of the morphin is increased from 50 to 100 per cent.

At my suggestion, Dr. C. W. Hooper, Director of Experimental Medicine of the H. A. Metz Laboratories, New York, carried out chemical and biological studies with magnesium sulphate. He prepared for me ampules containing a sterile solution of the pure chemical.

In 1923 in a paper "Tonsillectomies in Adults under Local Anesthesia" I made a summary of 1,089 tonsillectomies on private patients. In 542 cases local anesthesia was employed. As a preliminary medication 1/8 grain of morphin dissolved in 2 cc. sterile 25 per cent solution of magnesium sulphate was administered hypodermatically. The first injection was given one hour before operation and repeated one-half hour later. The tonsils were then infiltrated with 0.5 per cent novocain solution and enucleated. These magnesium sulphate and morphin injections produced an analgesic effect so that a very small amount of the local anesthetic was required. This was the first paper published in which magnesium sulphate and morphin were used as a synergist in novocain local anesthesia in head surgery.

About this time I was successful in bringing Doctors Gwathmey and Hooper together and in an extensive investigation they have established the synergism between magnesium sulphate, novocain and morphin, and also between magnesium sulphate and ether. Novocain acts synergistically with respect to the magnesium sulphate increasing greatly the analgesic and anesthetic potency of the solution when injected hypodermatically or intramuscularly without increasing the toxicity. The addition of the novocain to the magnesium sulphate-morphin combination increases the therapeutic efficiency of the solution at least 25 per cent and allays any irritation that may be caused by the magnesium sulphate. It also prevents the nausea and vomiting that frequently follow the use of simple morphin solutions. This solution may be successfully employed whenever morphin is indicated. The 2 cc. ampule will abolish pain for three or four times as long as when morphin alone is given.

As a result of this work Dr. Hooper developed ampules containing magnesium sulphate with novocain, and magnesium sulphate with novocain and morphin. These ampules are prepared in an exact manner after a large amount of careful research and clinical work. They are prepared from specially tested, chemically pure products and freshly distilled water. The solutions are sterile and will not produce local reactions or sloughs when injected intramuscularly with asepsis.

With this work as a basis, I have used two or three intramuscular injections at one-half hour intervals of 2 cc. sterile 50 per cent solution of magnesium sulphate combined with 2½ per cent novocain and 1/8 grain of morphin sulphate as a preliminary medication to local anesthesia. During the past year this preliminary has been used in approximately 100 tonsillectomies in which 0.5 per cent novocain solution was infiltrated around the tonsils. In about 20 additional patients the tonsils have been removed without the aid of local infiltration or general anesthesia. In six patients one tonsil has

been removed after injecting, in the usual way, 0.5 per cent novocain around one tonsil, and the other tonsil removed without the aid of local injections.

Two or three intramuscular injections of 2 cc. sterile 50 per cent solution magnesium sulphate with 2½ per cent novocain and ⅛ grain of morphin at one-half hour intervals before local anesthesia is wholly satisfactory for nearly all patients. The addition of the novocain not only definitely increases and prolongs the analgesic effect of the magnesium sulphate-morphin combination but it also entirely prevents the burning sensation complained of by many patients when ordinary hypertonic solutions of magnesium sulphate are injected.

The analgesia produced by the three intramuscular injections alone was sufficient and satisfactory in only about one-third of the selected cases in which the tonsils were removed without the aid of local infiltration. One of these cases was a woman of 70 years who was quite feeble, thin and anemic. Her tonsils had been treated by the *x*-ray and were full of pus from a chronic infection. I was afraid of an extension of the infection by injecting around them. After two injections of the magnesium sulphate-novocain-morphin combination in the deltoid the tonsils were enucleated without pain. In some cases of peritonsillar abscess the tonsils have been enucleated without local infiltration around the tonsils.

I have used this synergistic analgesia in tonsillectomies only, but believe that it may be employed successfully in all ear, nose and throat operations where a general anesthetic is either contra-indicated or not desired. It seems especially indicated in conjunction with local anesthesia for mastoidectomies where the cooperation of the patient is not essential and where general anesthesia is contra-indicated.

While I have done tonsillectomies in selected patients (quincies, aged and the septic) under its general analgesia, I believe its greatest usefullness will be found as a synergist and preliminary medication to local novocain anesthesia. In addition to its use as a preliminary medication for local anesthesia it also has great possibilities in the field of general analgesia when both general anesthesia and local injection of novocain are contra-indicated.

Summary of Technic and Dosage

For the average individual weighing 130 to 150 pounds, three intramuscular injections are usually required.

1. The patient should not be allowed food after midnight when operating in the morning and not after 9 A. M. when the operation is scheduled for the afternoon.
2. Three hours before the operation is to take place administer intramuscularly deep into the thigh, deltoid or subscapular region 2 cc. sterile 50 per cent solution of magnesimum sulphate combined with 2½ per cent novocain and ⅛ grain morphin.
3. Thoroughly cleanse the site of injection with iodin and alcohol and be sure the needle and syringe are absolutely sterile.
4. The lights should then be dimmed, the patient kept quiet and the surrounding conditions should be conducive to relaxation.
5. Repeat the intramuscular injections at half hour intervals until two or three doses have been administered, as may be required by the individual patient.
6. One hour or one hour and a half after the last injection the patient should be carried to the operating room on a stretcher and transferred to the operation table; it is very important that the patient should not exercise even to the extent of walking to the operating room after he has received the preliminary medication.
7. The patients must be carefully observed and considerable judgment exercised in regard to the dosage for different persons. As the morphin is the most potent drug in the combination idiosyncrasies for morphin must be recognized and dosage given accordingly.
8. If toxic symptoms arise treatment, as in morphin toxicity, must be instituted.
9. As the local anesthetic 0.5 per cent novocain is employed.

40 East 41st Street.

Pneumonia Therapeutics

EDWARD E. CORNWALL, M.D., F.A.C.P.
Brooklyn, New York

Pneumonia is a common and serious disease which has for us a never failing interest. Its intrinsic mortality is comparatively high, and in most cases the prognosis is dramatically concealed until near the end. The apparent ease with which some cases recover and the apparent inevitableness of the fatal termination in others, has powerfully stimulated the quest for a specific remedy.

The present status of the specific treatment of pneumonia seems to be this. No effective drug specific is known, and because of the inherent improbability of a chemical bactericide existing which can be given in effective and at the same time safe doses, investigation along this line is not very promising. Investigation along the line of biological specific treatment, which is the ideal treatment, has already made considerable progress and is bright with hope, but it does not seem as yet to have passed out of the experimental stage.

Lacking an effective specific remedy, or pending the discovery of such a remedy, how shall we treat this disease?

A large number of the cases of pneumonia that occur are treated by the symptomatic method. This method prevails extensively in present day therapeutics. It has merit if it is not carried too far, if its use is controlled by regard for the fact that symptoms do not necessarily call for treatment, being regularly constructive procedures and part of nature's curative plan.

On several occasions during the past dozen years I have published my views on the treatment of pneumonia, which can be summed up thus: Pending discovery of an affective biological specific, we should support nature in her treatment of the disease faithfully and intelligently, and use symptomatic treatment with great conservatism.

How can we effectively support nature in this disease? To do so requires understanding of the physiological and pathological situation. Nature effects her cure in a short time, usually about a week. The intrinsic mortality is probably less than the twenty-five per cent. commonly stated: it must vary with the treatment received in different cases: the margin between the mortality under what might be called the most favorable con-

ditions of treatment and that under the least favorable conditions, must be considerable.

Among the outstanding facts about pneumonia in its relation to the natural curative process which have a distinct bearing on its treatment, are the short duration of the disease and the tendency to circulatory instability.

In view of the shortness of the course of the disease and its tendency to develop circulatory instability, it is permissible to give smaller amounts of food than ordinarily would be required, thereby easing the laboring organism of some of the burden put on it by the processes of nutrition.

The tendency to circulatory instability depends on mechanical conditions in the lungs not so much, perhaps, as on the toxemias present, which act on the heart muscle to impair its functional capacity, as well as on its nervous connections, particularly on its vagus and sympathetic connections. Moderate vagus preponderance over the balancing sympathetic system causes the slow pulse and low blood pressure so commonly seen in pneumonia; a condition of excessive excitability of the vagus may result in a rapid and weak heart action. Besides the specific toxemias, there may be toxemias of intestinal origin which aggravate the circulatory instability. Hence it appears that the diet should not only be limited in quantity but also be of a character to minimize the toxemias of intestinal origen; which means that it should be of a character to favor the growth of the acidophilic over the saprophytic types of bacteria in the intestines. In other words, it should be strictly lactovegeterian rigidly excluding animal broths, egg albumin, or any of the prepared "peptonoid" food stuffs with which the market abounds, or any food stuff derived from an animal source except milk and its products. The diet should be fluid, and include enough water for eliminative purposes, but not enough to strain the heart. The saline ingredients, which differ somewhat in this disease from those required in the diet of health, should be provided for.

The pneumonia diet which I have used for some years consists in it full form of a daily ration supplying three pints of milk variously modified, the strained juice of three oranges or similar fresh fruit, two ounces of lactose, a half dram of calcium chloride, a dram and a half each of sodium chloride and sodium bicarbonate, and sufficient water to bring the fluid up to three quarts. This diet is modified to meet special conditions. If intestinal complications arise it is reduced to water, fruit juice and salts, or to water and salts alone. If the heart shows signs of much strain the water ration is reduced and in cases of unusual severity and regularly near the expected time of the crisis, the diet is greatly reduced.

The plan of diet above described, besides lightening the burden of nutrition and reducing intestinal toxemia, has the further advantage of making it possible to maintain a very conservative attitude toward artificial bowel avacuations in this disease; which conservatism I have found to improve materially the prognosis. A few years ago I reported two consecutive series of hospital cases of pneumonia, of 134 and 216 cases respectively, the dividing line between which, as regards treatment, was marked by the adoption of this conservative policy toward the use of artificial evacuants. The difference in mortality in favor of the second series, in which the bowels were generally allowed to remain unmoved artificially during the active period of the disease, was about one third. This conservatism in the use of artificial evacuants does not mean that they are never given, but that they are given only when some special indication arises other than omission of regular bowel movements; and usually if the case is seen early, and the bowels have not moved within twenty-four hours, an enema is allowed. The protection of the patient from disturbing factors coming from the alimentary canal which this conservative constipation gives, is an obvious inference from known physiological and pathological facts; but such constipation can not be safely allowed if the diet includes broth, albumin water and similar culture media for the saprhphytic bacteria.

Many cases of pneumonia in adults require at some time in their course support for the heart. This support should be given not as a matter of routine, or in a dogmatic manner, but to meet the exigencies of the case; that is, when needed and to the extent needed. I have found strophanthin given sublingually or hypodermically the most serviceable and least disturbing of the drugs of the digitalis class, for use as a heart stimulant in pneumonia. It has the advantage over digitalis of definitely increasing myocardinal tonicity and not stimulating the vagus. For emergency use caffeine can be given; and strychnine can be used for the purpose of stimulating the adrenal sympathetic system.

Outside of nursing, diet regulation and occasional heart stimulation there is little that we can do to help nature except to use symptomatic treatment with caution and judgment. Pain and distress in the beginning of the disease may properly be treated by poultices and perhaps even by opiates; but toward the time of the crisis, when it is necessary for the patient to breathe fast, and perhaps to keep awake, opiates should be given practically never. It seems unnecessary to say that heart depressing sedatives should be avoided, and that antipyretic treatment is mostly contraindicated, and that the administration of expectorants can generally be classed as meddlesome medicine.

Pending the discovery of an effective biological specific, one which is effective as diphtheria antitoxin is effective, I believe that we do best for our pneumonia patients is we give them good nursing, a fluid, lactovegetarian diet limited in amount of fuel and protein, but containing sufficient salts, vitamines and water; enough but not too much heart stimulation, and very conservative treatment of distressing symptoms; while we let the bowels alone unless exceptional conditions arise.

1218 Pacific st.

Physiology of the Mammalian Ovaries

A. J. Carlson, Chicago asserts that at present there is no reliable evidence that ovarian extract effects are specific for the ovary. Until it has been conclusively shown in spayed females that these extracts prevent the atrophy of the uterus and initiate and maintain estrual periods typical for the species, it seems clear that experimental ovarian organotherapy has not been placed on a scientific basis. The reasons for the past failures may be inherent in the complexity of the ovarian hormones and their practical failure to be active when given by mouth; but the ovarian field can point to no such persistent and systematic work of hormone isolation as we have in the case of the thyroid and the pancreas. The sex life of the mammalian female is developed and maintained by the ovaries through continuous and temporary hormone mechanisms.

Hormones acting more or less continuously develop and maintain the secondary sex organs and act to increase basal metabolism; temporary hormones from ripe follicles and corpus luteum initiate the estrual cycle, the early interaction between the fertilized ovum and the uterine mucosa, mammary gland hyperplasia and suppression of follicular growth. Menstruation appears to be only indirectly dependent on the follicular and luteal hormones, in that it follows failure of fertilization and atrophy of corpus luteum spurium. But the hormones initiating estrus are necessary precursors to menstruation. The initial cause in all menstrual disorders may be outside the ovaries and hence not to be affected by ovarian therapy. None of the ovarian hormones have so far been isolated, as determined by reliable biologic or chemical tests.

The Care of the Heart in Pneumonia

LOUIS FAUGERES BISHOP, M.A., M.D., Sc.D., F.A.C.P.

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It is a mistaken idea that death in pneumonia is always due to heart failure. Of course, the cessation of the heart beat is a sign that death has taken place. No one who has had much experience with acute lobar pneumonia is unmindful of the fact that toxemia and vasomotor paralysis are often the determining factors and that the heart often continued its function long after the patient was fatally overwhelmed by toxemia or prostration of the nervous control of the blood vessels. In other instances, however, the heart is directly involved in the process, in that the chemical processes in the heart are disturbed and the heart becomes profoundly disordered.

When the auricle is poisoned it is liable to fibrillate. It becomes paralyzed in a position of partial diastole and is disturbed by many irregular impulses, generating abortive and local fibrillary contractions. These impulses reaching the ventricle bring about frequent and irregular heart beats. When this happens in pneumonia the pulse becomes rapid and absolutely irregular and the circulation is no longer well carried on.

Here we must pause for a moment to make clear two very important points concerning the estimation of the circulation of the blood in examining sick people, particularly those suffering from pneumonia. The first observation pertains to pneumonia and that is, we are not usually able to feel the pulse which exists in the pulmonary circulation and has its origin in the right heart. And only by observing the effect of this on the jugular vein and by studying the pulmonic second sound do we draw any objective conclusion at all.

Men have often been deceived by a good pulse at the wrist into believing that the whole circulation was in good order when in fact disaster was in the immediate foreground. I always carry this in mind in the presence of lobar pneumonia.

The second point is one of more general application and it means that circulation of the blood cannot be estimated by observing the pulse. The pulse is a wave motion in the blood stream and has nothing to do in regard to whether the blood is moving or not. If you throw a stone into a river the waves travel up and down the stream and are rather disturbed than otherwise by the flowing of the water. Much more beautiful waves are produced if you throw a stone into still water. In fact in clinical medicine obstructive capillaries are often accompanied by a bounding pulse, while relaxed capillaries, such as are often found in shock, go with a very slow pulse.

Be not deceived by a good pulse at the wrist when breathing and the circulation are not being well carried on and do not despair of the circulation when the pulse is hard to feel. What makes this very important is that suitable medication may be neglected in the presence of real heart failure with a good pulse, and much damage may be done by frantic stimulation of a poor pulse when in fact the circulation is entirely satisfactory.

Fibrillation is the determining event in many fatalities. To prevent this a successful treatment of the toxemia is needed, but failing in this, when fibrillation supervenes, we must deal with it as such. Digitalis, as all the world knows, is the specific remedy for fibrillation. But, unfortunately, there is a time element in the action of digitalis that cannot be escaped and the administration of even heroic doses, when fibrillation has begun, is often not effective. The time to give digitalis is before fibrillation begins so that it may never have a chance to do its harm. The administration of digitalis should be begun at the very beginning of the disease. One grain of the powdered leaves every eight hours makes a good routine formula for every febrile condition that may lead to pneumonia. One grain every four hours if acute lobar pneumonia is present and one grain every three hours if the case is seen late. These are average doses, to be modified by the needs of the individual person. This routine has proved satisfactory in hospitals and private practice. I would not like to think that I had neglected the early administration of the drug in any person suffering from this disease.

The prevention of pneumonia should be considered. Many persons, particularly physicians, go on working while they are ill with mild influenza. This leads to death from pneumonia because of the exhaustion of reserve strength in the beginning.

With regard to diet it is folly to over-burden the person suffering with pneumonia with excessive food. The greatest blood pressure disturbing influences are drastic cathartics and other measures that reduce intra-abdominal pressure. Do not torture the belly to cure the chest.

Judgment is required in applying fresh air treatment to feeble people.

The use of digitalis in pneumonia, naturally, raises the question of the effect of fever on the action of this drug. There is a strong tradition that digitalis does not act in persons with fever. This is due to the fact that it does not slow the heart when the high rate is due to an irritation outside the heart itself, such as fever. On the other hand, it has been shown by laboratory experiments that the toxic dose of digitalis is less in animals when the body temperature has been artificially raised. From this we might infer that heroic doses in people with high fever involves an increased risk. This is a strong argument in favor of the continuous use of small doses from the beginning of the pneumonia, rather than reliance upon heroic doses when fibrillation begins.

There are two factors to consider with regard to the heart in pneumonia. The first is the extra work thrown upon the right heart by the obstruction to the circulation in the lung. The second is the effect of the disease itself upon the heart. Thus we have to deal with an overworked and, at the same time, a sick organ. The mechanical factor has been well considered, as has also the use of digitalis.

The first element with which the heart has to contend is the deficient supply of oxygen through the poor circulation of the blood. We can picture a fatigued, poisoned right heart like a sick person working in an atmosphere lacking in oxygen.

After prolonged pneumonia the heart is always found, under microscopical examination, to be damaged through a diffused myocarditis, with cloudy swelling of the cells and sometimes with fragmentation of the muscle fibres. Usually, the striatious disappear from many of the fibres

and there are often extensive areas of round cell infiltration. Probably no heart in any case of pneumonia escapes entirely and we all know that many persons suffer enfeeblement after such an attack.

A usual cause of high mortality in pneumonia is the lack of proper early treatment owing to the fact that diagnosis is often delayed for two or three days. Then it is not called by its proper name for fear of frightening the sick person. Only when a person is very sick is the nature of the disease revealed and active treatment instituted. If pneumonia is early recognized and properly treated the mortality is very much diminished.

The treatment of pneumonia has been a field of battle of contending schools for centuries, yet the death rate has not materially decreased. The physicians of former days at least had definite ideas of therapeutics while many physicians at the present time neglect active treatment of any kind.

A hundred years ago blood letting was carried to excess, and later it was neglected entirely. I have always believed that much of the excessive blood letting that we thought existed at that time was in fact not excessive, but that the men who did it had to deal with a different type of disease. During the epidemic many of us saw examples of terrific cyanosis that made bleeding seem the right thing to do, and it was very different from the pneumonia that we were accustomed to see when influenza was not epidemic. It is hard to think that all physicians were entirely wrong at the time when so much bleeding was done, since we know they were men of just as much good judgment as in any period of history. Indeed, we have every reason to believe they were like good physicians of all times trying to render honorable service.

At one time it was the fashion to dose patients with large quantities of alcohol and there are still advocates of this system. And then there was the antipyretic treatment by drugs and by hydrotherapy. Hydrotherapy was certinly much safer than phenacetin, antifebrile, antipyrin and other coal tar products. But hydrotherapy is a difficult art and is not practicable in New York. lately, some have advocated the use of antiseptics with the idea of destroying the germ. Now, in these days, of course, we have the vaccine treatment.

As to the result of treatment when we are dealing with an acute and self-limited disease, we must recognize the fact that a large proportion of persons get well without treatment. So we must not bank too much on any particular form of treatment without careful analysis.

There is a particular type of doctor who comes into every discussion of pneumonia. This is the doctor who has a specific treatment for pneumonia and who has never, or seldom, loses a patient. This man is one who does not usually fall into the error mentioned above in not making an early diagnosis, but diagnoses pneumonia early, in many people. He is always a man not connected with any great hospital service and he is certainly not engaged in consultation practice. He ceases to exist when circumstances throw him into contact with a real problem of acute lobar pneumonia. Another type of man for whom I have great admiration is the man practicing in isolated districts, without help. He has been trained in the use of drugs for affect and has learned to handle them in all kinds of emergencies.

In practice we have to deal not only with the person who comes to us with pneumonia, with a healthy heart, but those who who come to us with a degenerated organ. When there is advanced coronary disease and degenerated heart muscles our problem is a difficult one.

A heart showing a split R wave in two or three leads of the electrocariogram or with an abnormal downward T wave is not a good subject for pneumonia. Failure of the heart muscle may be feared when we believe there is granular degeneration of the muscle fibre from high temperature or toxemia, when the pressure is so low that the circulation of the heart itself is not properly carried on and, at the same time, the circulation is lacking in back pressure suitable to its proper activity. Also, we fear for the heart when the breathing is so bad that the heart is not helped in the way that it usually is by the action of the lungs. We also fear for the heart when there is evidence of profound toxemia which must involve the heart muscle and all other tissues. Last of all we know that the heart is destined to have a hard struggle when consolidation of the lungs is very extensive.

People with split R waves and abnormal downward T waves in the electrocariogram should be particularly protected from exposure and exhaustion. The bad effect of high fever should be met by the lowering of the temperature by several processes.

There is no doubt of the value of hydrotherapy early in pneumonia, in a suitably organized institution. It is practically impossible in private practice, though our late esteemed friend, Dr. Simon Baruch, for many years tried to teach us to the contrary.

To combat the danger of low blood pressure we should try to maintain the pressure in every possible way. I have felt for a long time that the real battle was with the peripheral circulation and that what really led to ultimate failure of the heart was its futile efforts to fill dilated blood vessels. And here one should always have his eye on the abdominal cavity that can so insidiously drain off the blood that is so much needed in the rest of the body.

Sir James Barr advocates the use of abdominal ice bags in pneumonia with high temperature. He observed that one or more ice bags sufficient to cover the whole abdomen lowered the temperature and from the action of the splanchnic area raised the general arterial pressure. This procedure also resisted abdominal distention and, he believes, increased the depth of the respirations and lessened their frequency. He says that the abdomen is not very sensitive to cold, except in the groins, which should be protected with cotton. He found that people with pneumonia did not object to this form of treatment.

What is needed for better care of the heart in pneumonia is: First—a more precise diagnosis of its real condition. Second—the anticipation of emergencies before they arise, and third, that the heart shall not be treated with a view to overcoming things which are not its fault, particularly, vasomotor paralysis and toxemia.

Beyond the use of digitalis, in order that tht system may be partially saturated and in view of the possible threatened failure later on, it is better to abstain from cardiac drugs and concentrate on other forms of treatment. Specific serum treatment should always be considered.

The heart is the most faithful organ in the body. It does not need to be stimulated. The disease itself is a vastly more powerful stimulant than we can supply artificially.

Rnd lastly, let me make a plea for the consultant. Do not delay calling him until the last moment. In this very serious disease he will not like to tell you what he often knows of the measures that should have instituted several days before.

109 East 61st Street.

Sulpharsphenamine in the Treatment of Syphilis

ALBERT PFEIFFER, M.R.C.S., L.R.C.P.

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Albany, N. Y.

Since 1910, when Ehrlich announced the discovery of arsphenamine for the treatment of syphilis the need has been felt by the profession for a product, similar in nature, but more adaptable for general application, particularly in treating children, obese subjects and those who have had long courses of treatment in whom suitable veins are often difficult to find, as well as in the so-called arsenic fast cases where a change of drug is desirable.

Such a preparation is now available in sulpharsphenamine. It has been accepted that the medical value of a preparation could only be ascertained after its intensive use for more than a year and then in the hands of more than one clinician. Shortly after and as a result of an announcement of the United States Public Health Service regarding sulpharsphenamine* this product was made in the arsphenamine laboratory of the Massachusetts Department of Public Health. The drug was examined at the Hygienic Laboratory of the U. S. P. H. S. and by Dr. Reid Hunt at Harvard Medical School and had a comparatively low degree of toxicity, about 400 mgm per kilo; a considerable number of animals survived as high as 500 and 600 mgm per kilo. (The usual standard adopted for the neo product is 200 mgm per kilo.)

The preparation was then placed in a few state clinics for observations of its practical application. The chemistry and the comparative trypanosidal value based on laboratory experiments upon rodents has been demonstrated. The observations of its value on patients based upon its general use on various types in the different stages of syphilis by twenty clinic chiefs covering a period of about two years of over 15,000 doses based upon 0.6 gm. are hereby recorded.

The reports from the superintendents of seven state hospitals for the insane are given in addition to those from the general clinics.

The questions to be determined by the clinicians were:

1. The therapeutic value as to its action on lesions and the Wassermann test compared with other arsenicals.

2. The technique preferred as to preparation and administration and reactions.

The following statements which, due to their number, must of necessity be brief have been received.

Therapeutic Value

1. "I believe sulpharsphenamine to have a therapeutic value about equal to arsphenamine and greater than any neo in that the lesions heal as rapidly as under any other arsenical, the clinical results are fully as striking, and serologically the results are better. We have obtained a negative Wassermann in quite a number of patients in whom we supposed to be Wassermann fast."
2. "About the same as arsphenamine."
3. "As good as any preparation I know of."
4. "The effect on lesions about like the other preparations. It certainly equals neo. Sometimes perhaps the equal of arsphenamine. Not as effective as the latter in reversing Wassermann. I have seen some remarkable results following a single injection."
5. "Has a more effective therapeutic general value and a more satisfactory anti-luetic treatment than arsphenamine."
6. "Wassermann tests negative after course of sulpharsphenamine when previous course of arsphenamine and mercury have failed to give successive negative Wassermanns."
7. "I have found sulpharsphenamine preferable to any other preparation."
8. "I consider sulpharsphenamine of more therapeutic value than former state product. It clears up the lesions more readily and gives early negative Wassermann reactions."
9. "No better than arsphenamine. Practically equal to arsphenamine."
10. "Lesions heal promptly. Negative Wasserman obtained as quickly as with any other previous treatment."
11. "Clinically slightly less active in early syphilis than arsphenamine. Negative lesions of late syphilis slightly more active than arsphenamine. On the whole about the same as arsphenamine and neo. Wassermans about the same."
12. "Sulpharsphenamine intramuscularly is only a little less effective and considerably slower than neoarsphenamine intravenously."
13. "Lesions clear quickly and Wasserman reactions are better in chronic cases. Equally as good in acute cases."
14. "I have not been able to determine any inferiority or superiority to the other arsenicals."

Five chiefs of clinics reported therapeutic value about the same as other arsphenamines while one reported the only excuse for giving it was inability to find veins.

Reports From Seven State Hospitals for the Insane

1. "The therapeutic value so far as we can determine is high, that is placing the therapeutic value on a conservative estimate. We have found since we have started using sulpharsphenamine that the percentage of negative Wassermann reactions in the case of chronic syphilitics has greatly increased. We have not had for some time any patients with active syphilitic lesions present externally, so are unable to give you any data as to effect of sulpharsphenamine on such lesions. We can not determine any definite improvement in the condition of patients whose central nervous systems have been greatly effected by syphilis, but we feel sure that some benefit must have been obtained on account of having negative serological results in a number of cases."
2. "We have no primary cases. Several cases (tertiary) became negative after one course of sulpharsphenamine and mercury."
3. "The results do not seem to differ from the results obtained by the intravenous use of arsphenamine."
4. "We have found that many of the cases reported negative blood Wassermanns after a course of eight treatments, a factor which was not demonstrated when treating patients with plain arsphenamine."
5. "Changes recorded in spinal fluid cytology and gold curve compare favorably with results obtained with other arsenicals. The Wassermann test, however, has shown tendency toward negativity in only a few cases. This may be accounted for largely by the advance type of cases treated."
6. "On forty-seven patients who were under treatment last April
   9 had a negative blood then, and is still negative;
   16 had a positive blood then, that is still positive;
   16 had a positive blood then, that has become negative since;
   2 had a negative blood that has become again positive;
   4 had a positive blood that has become doubtful since."
7. "Fifteen cases of psychosis regarded as having late manifestations of syphilis have received treatment including sulpharsphenamine intramuscularly or intravenously since report of last April. One formerly positive spinal fluid Wassermann has been found to be negative; three blood Wassermanns have become negative and one Kahn test on blood has been found negative instead of previous positive Wassermann."

Technique Preferred as to Preparation and Administration and Reactions, If Any

1. "Most of our injections are given intravenously 0.6 gm. to 20 cc., except in children, when we give it intramuscularly in concentrated solution—0.3 gm. to 0.9 cc. A considerable number of our patients show arsenical dermatoses after five or six doses. Immediate reactions are much less common than with other preparations."

* Sulph-arsphenamine, Its Manufacture and Its Chemical and Chemo-Therapeutic Properties. Carl Voegthin, J. M. Johnson and Helen Dyer, Public Health Service Weekly Report, November 10, 1922.

Appended is a report on 18 cases:

No.	Diagnosis	Last Wass. before Course	Total Amount	No. of Doses	Wass. after Course.	Clinical State
25045	General Paresis	bl. pos.	7.7	13	———	Neurological side prominent; patient barely able to stand. Unimproved.
23341	General Paresis	bl. pos. sp. fl. pos.	6.8	13	bl. presum. pos.	Mild mental and neurological case. Has also had long courses of arsphenamine.
25131	General Paresis	bl. pos. sp. fl. pos.	5.6	11	———	Mostly mental. Unimproved.
23978	General Paresis	bl. pos. sp. fl. pos.	5.7	11	———	Mental and neurological. No improvement.
23994	General Paresis	bl. neg. sp. fl. pos.	10.4	19	bl. neg. sp. fl. pos.	Symptoms very mild, unsteady gait, emotional depression. Unchanged.
15383	Dementia Praecox	bl. pos. sp. fl. pos.	5.6	10	bl. neg.** sp. fl. neg.**	No clinical signs of lues; no change.
24559	General Paresis	bl. pos. sp. fl. pos.	2.55	7	bl. neg. but later doubtful**	Severe mental and neurological symptoms. No improvement.
25077	Cer. Arteriosclerosis	bl. pos. sp. fl. neg.	6.6	12	———	No clinical signs of lues; no change.
23965	General Paresis	bl. pos. sp. fl. pos.	5.9	11	bl. presump. pos.	Severe mental and neurological* symptoms. Grew worse under treatment.
20417	Tabe Paresis	bl. neg. sp. fl. doubt.	6.0	11	bl. neg.	Neurological symptoms prominent. No improvement.
20676	General Paresis	bl. pos. sp. fl. neg.	4.7	11	———	Mostly neurological.** Seizures are less frequent.
25037	General Paresis	bl. neg. sp. fl. pos.	6.8	13	bl. neg.	Mental and neurological case. Unimproved.
24501	General Paresis	bl. pos. sp. fl. neg.	5.4	10	bl. pos.	Mental mostly. Much improved.**
24936	General Paresis	bl. pos. sp. fl. neg.	1.7	5	bl. neg.**	Mental and neurological.** After five doses he was able to be up and about, so went to clinic for arsphenamine. Improvement did not continue, however.
24173	General Paresis	bl. neg. sp. fl. pos.	4.7	10	bl. neg.	Mostly mental. Unimproved. This was the finish of a long course of arsphenamine and mercury.
23676	General Paresis	bl. doubt. sp. fl. pos.	2.55	7	bl. neg.**	Neurological symptoms* prominent. Now worse.
25111	General Paresis	bl. pos.	6.8	13	———	Mostly neurological. Unimproved.

* Points out a change for the worse. ** Points out a change for the better. All these patients had injections of mercury salicylate approximating 0.06 gms. for each dose of arsenic.

2. "0.6 to 0.9 gms. to 50 cc. of freshly prepared, sterile, distilled water given very slowly with large hand syringe, intravenously. Many of the early cases will receive this amount every three days for the first three days until eight injections are given. Have seen no reactions in my personal use of about 300 injections."

3. "Intravenous. Reactions—none."

4. "Intravenous simple and less painful. Give some intramuscularly but gives discomfort, though some of my friends use it extensively intramuscularly with children without discomfort. Reactions are infrequent. We have severe dermatitis in the ward from sulpharsphenamine given by an outside physician."

5. "Solution in freshly distilled water 1 to 10. Solution always filtered. Given intravenously, slowly. Dosage has not exceeded 0.9 gms. and has been less than that when administered to underdeveloped or under-nourished patients. Reactions—none."

6. "Intramuscularly exclusively and usually given 0.3 gm. to 1 cc. of distilled water. Slight toxic reactions in some cases and in other cases mild nitritoid, some local burning and smarting on administration and tenderness for a day afterwards."

7. "I prefer freshly distilled water as a solvent administration being either under the skin or into the muscle. I am inclined to think I have had less pain in the former method. I have used the region around the shoulder blade for the site of injection. I have had no unpleasant reactions other than frequent complaints of pain directly following this injection. Since I first began this use, I have had one case of arsenic rash. Administered 12 doses, 10 of 0.3 gm. and 2 of 0.6 weekly."

8. "0.9 gm. given in 20 to 30 cc. freshly distilled sterile water intravenously. Reactions very slight and scattered cases much less than arsphenamine."

9. "Doses 0.6 gm. given intravenously. No primary reactions, but a few cases have developed neurologic symptoms."

10. "Dose 0.3 gm. in 20 cc. distilled water given by syringe intravenously. Reactions less frequent."

11. "Dose 0.2 and 0.3 gms. intramuscularly or subcutaneously. 0.6 intravenously. Reactions—dermatitis, peripheral neuritis, nausea."

12. "Dose 0.6 gm. for active lesions—0.3 gm. for chronic, administered intravenously. Reactions—seldom and very mild."

13. "0.4 to 0.6 gms. For intravenous use, 10 to 20 cc. double distilled sterilized water. Subcutaneously, the whole dose in 0.5 to 1 cc. of water. Intramuscularly, seems rather painful. Subcutaneous is rarely uncomfortable and is very valuable in a few cases of aortitis where a severe reaction follows the intravenous use of all the arsenical group. Reactions—prompt reaction seems less than with the other preparations. Sickness and vomiting occur less often. Arsenical dermatitis seems perhaps to be a little more common than with the others."

14. "0.6 gm. dissolved in 10 cc. distilled water. A few reactions immediately after injections of no serious consequences. Fewer reactions than with neo or arsphenamine."

15. "0.6 gm. in about 10 cc. of water intravenously given slowly. No reactions."

16. "0.6 gm. to 0.9 gm. dissolved in 10 cc. of water given intravenously. No reactions."

17. "0.6 gm. dissolved in ampule and injected with syringe, slowly, intravenously. Reactions—practically none. Slighter and less frequent than with the straight arsphenamine."

18. "0.3 to 0.4 gms. intravenously, 0.1 of drug to 2 or 3 cc. freshly distilled sterile water. Intramuscularly 0.3 gm. in a little less than 1 cc. of water. Reactions—one injection followed by nausea (immediately), one by skin rash and one by phlebitis. All in the intravenous use. Subcutaneously, pains have been complained of for a short time. Have used about 200 doses."

19. "0.3 gm. in 1 cc. of water subcutaneously. Reactions—considerable pain in some patients, especially in thin and nervous patients. One patient had a skin rash. No other reaction."

20. "0.1 gm. in 1 cc. of sterile saline solution in buttocks (children). No reactions whatever."

State Hospitals

1. "0.6 gram ampule filled with sterile water allowed to stand a few minutes and injected intramuscularly. No reactions have been noted yet. Local tenderness in some cases."

2. "0.6 gm. intravenously. 3% solution. Reactions—none."

3. "0.2 gm. working up to a maximum of 0.6 gm. Administered intramuscularly in the buttocks, a 50% solution once a week. No general reactions have been observed. Local reactions consist of a burning sensation which has not been serious enough to cause complaint from our patients."

4. "Intravenously, when possible. Observed no reaction."

5. "Average doses 0.6 gm. Intravenous and intramuscular routes equally effective. Intravenous 3% solution; intramuscular and subcutaneous, 30% solution while tolerated. Intra muscular injections preferred to subcutaneous. No general reactions. Local.

(*Concluded on page* 81)

The Basal Metabolism in Obesity*

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Respiratory Quotient

The amount of heat generated by animals including man can be quite accurately calculated by calorimetry. It varies constantly in different species. A mouse, for example, requires thirty times more calories per unit of body weight than a horse, notwithstanding the single cells in the mouse are about the same size as the cells in the horse. Yet, on the other hand, according to unit of surface area, a mouse, a fowl, a horse, and a man, have same basal metabolism.

When we determine the heat elimination by direct calorimetry, the result is expressed in heat units—calories. To estimate the heat production in calories, we first find out the oxygen absorption, and respiratory quotient, the latter is the volume of carbon dioxide eliminated—divided by the amount of oxygen absorbed in a given period of time. The respiratory quotient is the index of the kind of foodstuffs being combusted in the body. No matter whether a certain food material is burned in the body, or in a bomb calormeter (during combustion), a certain amount of oxygen will be consumed and a certain amount of carbon dioxide evolved. Therefore the ratio CO_2 will be a constant, for any given substance, but will vary according to the structure of the molecules in different substances. The respiratory quotient for the ternary food stuffs, protein, fat and carbohydrates are known. For proteins the respiratory quotients is .81; for fats the respiratory quotient is .71; and for cane sugar (carbohydrates) the respiratory quotient is 100. Knowing the theoretical respiratory quotient for the three ternary food elements, and having obtained the patient's respiratory quotient by experiment, we can easily determine how much of his total heat production is due to fat, to protein, and to carbohydrate combustion. However, in the case of protein, this does not strictly hold, since proteins are not so completely oxidized as the other two food elements.

Now that we know the respiratory quotient of the three classes of food stuffs, and also their heats of combustion, and that they produce the same volume of heat, whether oxidized in the body or burned in a bomb calorimeter, it is possible to determine, with more or less accuracy, the calories of a liter of oxygen for any respiratory quotient between .70 and 1.00. Therefore, if we have determined the respiratory quotient, and know the oxygen consumption, we can calculate the heat production as follows (after Mean's [a]):

Oxygen absorption per hour	×	Caloric value of oxygen for the R. Q.	=	Calories per hour

For example, if the oxygen consumption were 12 liters per hour and the respiratory quotient was estimated at .85 the equasion would be expressed as follows:

$$12 \times 4.863 = 58.4 \text{ calories per hour.}$$

4.863 is the caloric value of oxygen for a quotient of .85.

Metabolism

During the process of digestion the food products absorbed from the gastro-intestinal tract undergo various transformations in the body. Some are almost immediately broken down into simpler compounds, which are eliminated from the body through the excretory organs, some are stored in the organism unchanged or after undergoing transformation into more complex substances—are used in building up the body. These changes of matter constitute metabolism, constructive on the one hand and destructive on the other. It is the latter that witnesses the transfer of potential into dynamic energy.[2]

In the study of metabolism we become acquainted with the exchanges of material by which vital phenomena are produced, and energy expended. The various metabolic processes are not the same in all organs and tissues. For instance, the function of the liver and of the pancreas are distinctly different. By the maintenance of artificial circulation through "surviving" organs, completely severed from their normal relations, the life of the cells may be continued for many hours. Chemical examination of such tissues has thrown light on their metabolic processes; under such conditions changes in the composition of the nutrients in the circulating medium point to the nutrient demands, the waste, or the specific elaborations of the cells. Furthermore, by the exclusion of individual organs, their normal activity may be inferred from the absence of certain functions. Moreover, the changes in metabolism which go hand in hand with diverse pathological conditions of the body, have also contributed to our understanding of the subject. The body is a human laboratory of nicely balanced chemical reactions in which the various materials derived from the foodstuffs are hydrolized, oxidized and otherwise altered by means of special ferments, which convert potential into kinetic energy.

The Rate of Metabolism

Estimation of the rate at which heat is formed in the body discloses this to be a subject of considerable variations even in a given individual. By the term "basal metabolic rate" of an organism, is meant the animal heat production of that organism.

Basal Metabolism

It is quite evident since the rate of metabolism is subject to various physiological fluctuations, any estimations that are to be used for purposes of comparison, must eliminate all muscular activities as well as the ingestion of food. Accordingly it has become the fixed rule when determining energy metabolism (1) to have the individual in a fasting condition at least 14 to 18 hours since the last meal. (2) the individual must be in a condition of as complete repose as possible (quietly lying in bed). The energy metabolism under such conditions is known as The Basal Metabolism, yet this is not the lowest basal metabolism, for it has been shown that metabolism sinks even to a lower level during prolonged sleep. Still, however, it furnishes a convenient working basis of comparison for different individuals, and even for the same individuals under varying circumstances. This minimal heat production may be determined directly by actual measurement by means of a calorimeter, or indirectly by calculating the heat production from an analysis of the end-products which result from oxidation within the organism, or specifically from the amount of oxygen used and the corresponding amount of carbon dioxide produced, together

* In preparing this article, the author has derived much help from the writings of J. H. Means, M.D., E. F. DuBois, M.D., and others and acknowledges his indebtedness to their researches.

with the total nitrogen eliminated in the urine. The comparison of the basal metabolism of different individuals shows various differences. In a general way the basal metabolism increases in proportion as the body weight of the subject increases, and calculations based on this law are used as the rate of metabolism per unit of body weight.

When the effect of food, cold and muscular exercise, are taken into account, the metabolism for any individual from day to day, year in and year out—provided the weight remains constant—will be found to stand around a normal level. Means[3] of Boston thinks we have in Basal Metabolism a factor almost as constant as body temperature, pulse and blood pressure, and one that throws light upon calorific demands of the body.

If we are studying the basal metabolism of a man weighing 70 kilograms (156 lbs.) we would find that he will actually require 1,680 calories per day, which would be his heat production if he was lying quietly in bed in a comfortable room, but if he was engaged in moderate activity, his caloric requirements might become 3,000 to 4,000 calories per day. For instance, in severe hyperthyroidism, the basal metabolism may be doubled, so that a patient with such a malady might have a basal metabolism of 3,000 calories plus, and an actual metabolism that would go far beyond 3,000 calories. Therefore the basal metabolic rate of such a patient would indicate the necessity for a greater caloric food intake in order to keep his income and outgo in equilibrium.

In a general way the basal metabolism increases in proportion to the weight of the subject, still, however, lighter individuals though showing a lesser total metabolism than heavier ones, usually will be found to have a greater metabolism per unit of body weight. Likewise, tall, slim persons will be found to have a greater surface area and a greater metabolism than short individuals of the same weight. These facts opened the way for comparing the rate of metabolism with the area of body surface.

It is difficult, however, to establish a dependable basis of comparison even with reference to body surface, for we know that athletes have a somewhat higher rate of metabolism than do active men of the same height and weight, because the former have a greater amount of active protoplasm.

The basal heat production, or the caloric value of the food material combusted by man when fasting and at rest varies (1) according to the extent of body surface area, and (2) with age. External temperature and disease also influence basal heat production. That of a man weighing 70 kilos (156 lbs.) is about 70 calories per hour, or 1,680 calories in twenty-four hours. Of course this presupposes that the man is well nourished and remains quietly in bed, at least 14 to 18 hours since the last meal (in the morning) without food since supper the night before. Its relation to the total combustion during activity is shown in the following table. Lusk[4] gives the daily food requirements.

Man quietly in bed 24 hours burns	1680 cal.
Man quietly in bed 8 hours (work sitting in chair 16 hrs.) burns	2170 cal.
Man quietly in bed 8 hours (14 hrs. moderate work, 2 hrs. exercise) burns	2500 cal.
Farmer, sleep and work burns	2500 cal.
Stone mason, sleep and work burns	4300 cal.
Wood sawyers, sleep and work burns	5400 cal.
Rider 6 day bicycle race burns	10,000 cal.

The loss of heat from the body is influenced by four main avenues of escape: (a) raising the temperature of food and air which enter the body, (b) vaporizing the water and setting free CO in the lungs, (c) evaporation of moisture from the surface of the body, (d) radiation and conduction from the body surface. A man expending 2,700 colories of energy daily will show the following. Table by Murlin[5].

	Calories
1. Warming food and drink to body temperature	42
2. Warming air to body temperature	35
3. Evaporation of moisture from body surface and lungs	558
4. Heat equivalent of external work done	51
5. Loss of radiation from entire surface of the body	1,181
6. Loss by conduction to air from body surface	833
	2,700

Law of Surface Area

The question of heat loss through the skin bears a close relationship of heat loss to heat production known as the "law of surface area" promulgated by French authorities some 80 years ago. One of these early writers said: "As the heat loss is proportional to the extent of free surfaces and these latter are to each other as the squares of their homologous sides, it follows of necessity that the quantity of oxygen absorbed, or what amounts to the same thing, the heat produced on the one hand and the loss on the other, is proportional to the squares of the corresponding dimensions of the animals one is comparing." Muntz in 1879, while investigating the maintenance of race horses, came to the conclusion that there was a direct relationship between the area of skin surface and the requisite food requirements. Emphasizing his conclusions he says: "A notable part of the food certainly is consumed to maintain the vital heat which has a tendency, constantly to be lost by radiation or conduction to the surrounding medium." Another cause of heat radiation is continuous evaporation from the skin, which is a function of the skin surface if it is not directly proportional thereto. The evaporation produced by the organs of respiration may equally be regarded as having a relation to the surface of the body, the preponderating influence of body surface upon the apportionments of the maintenance ration."

Various investigators have worked out formulas for determining the surface area of the human subject, and until recent years, the calculations of Meeh were universally followed. His formula was based on the law that the surface of similar solids are proportional to the 2/3 power of their volume. He made actual calculations of the surface area of a number of persons, calculating the weight in kilograms to represent the volume, multiplied by a constant 12,321 which gave results within 7 per cent of his actual measurements. The practical application of this formula gives fairly accurate results for individuals of average build, but not for persons of unusual stature, as in the obese, where the calculations may be in error as much as 40 per cent.

DuBois[6] has recently devised a formula based on linear measurements of various parts of the body, which gives a very close approximation of the surface area of the body, as determined by actual measurements. He found on comparison, that his calculations between measured and calculated determinations, agreed within 2 per cent. His calculations were later simplified, so that a formula containing total height, weight, and certain constant factors were devised, which furnishes a fairly accurate method for determining the surface area of the body. The formula is:

$$A = W^{0.425} \times H^{0.725} \times C$$

which is known as the height, weight formula and chart. A. is the area in sq. cm., H. is the height in centimeters, W. is the weight in kilograms, and C. is the consonant 71.84. The chart below based upon this formula, fur-

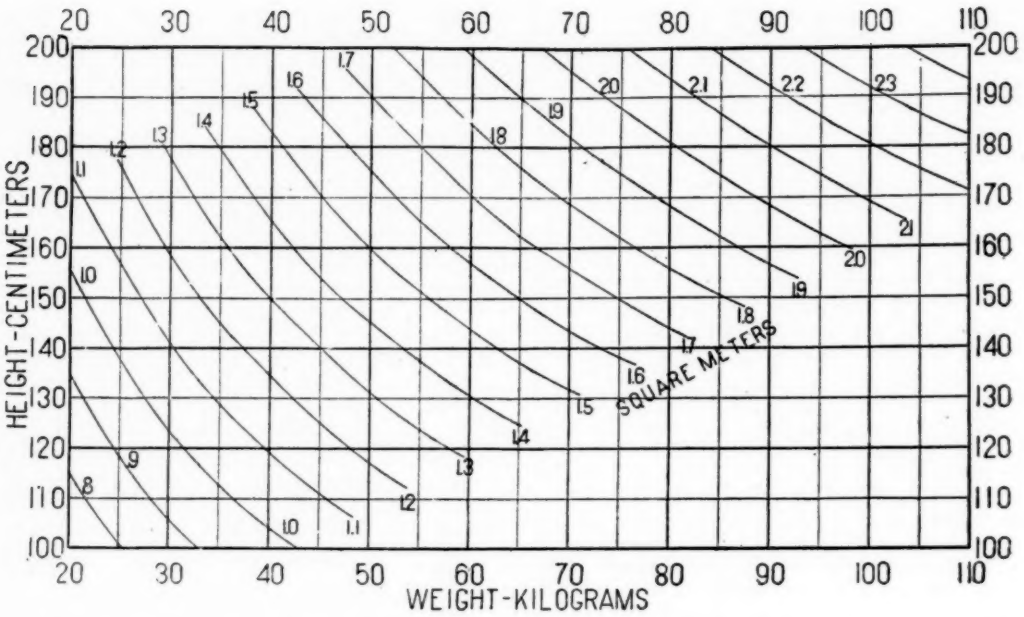

Chart for determining surface area of man in square meters from weight in kilograms (Wt.) and height in centimeters (Ht.) according to the formula: Area (Sq. Cm.) = $Wt.^{.425} \times Ht.^{.725} \times 71.84$.

lishes direct readings of the surface area when height and weight in metric units are known. This table graphically shows at a glance, the approximate readings for surface area in square metters. The DuBois formula gives fairly good results with an average error of only 1.5 per cent as compared with actual surface area measurements, and a maximum error of 5 per cent, while the average error of the Meeh formula is estimated at about 15 per cent.

The body surface law of Rubner for determining basal metabolism (according to surface area) gives more satisfactory results. Means thinks,[7] than any one factor so far discovered. The great difficulty which has perplexed research workers in this field since the time when the question of metabolism and body surface area were first brought out, has been the need of accurate methods for measuring and determining body surface area from body weight, such for example, as those of Meeh and others. For individuals of normal stature, the Meeh formulae may do fairly well, but for the portly and obese it would not do. For instance, two persons of the same weight, one short and stout, the other tall and slim, the latter would have the greater actual surface area, yet according to the Meeh formulae, the calculated surface area for the two persons would be identically the same.

The Massachusetts General Hospital formerly used the linear formula for determining body surface area, but now depends upon the DuBois height weight chart, except in very stout persons, where it is thought more accuracy is secured with the linear measurements.

The normal basal metabolism of a healthy adult male, as calculated by the DuBois formula, is found to be 39.7 calories per sq. meter of body surface per hour. It varies with age and sex as shown in the table below taken from DuBois' work.[8]

It is clearly obvious that the rate of metabolism is subject to noticeable physiological oscilations, so that any determinations that are used for purposes of comparison, must not include the effects of exercise and the ingestion of food. Therefore, it is necessary when determining the energy metabolism (1) to have the individual in as complete repose as possible, and (2) in a fasting condition as least 14 to 18 hours since the last meal.

Table—Calories per sq. meter, per hour:

Age	Males	Females
12-14	49.9	43
14-16	46	40
16-18	43	38
18-20	41	37
20-30	39.5	36.5
30-40	39.5	36
40-50	38.5	35
50-60	37.5	34
60-70	36.5	33
70-80	35.5	

Harris and Benedict[9] conducted a careful biochemic study of the basal metabolism in the normal adult including 136 men and 103 women and found the most intimate correlations when due allowance is made for body size, by expressing heat production in calories for area of body surface in square meters. These same investigators found that an increase of 1 kilogram of weight in the adult can cause an increase of oxygen consumption of 2.27 c.c. per minute and a carbon dioxide increase of 1.87 c.c. per minute. When the body weight of an adult is increased 1 kilogram, the total heat production for 24 hours is likewise increased, the average being about 15.8 calories for men and 8.27 for women. There is a fairly stable correlation between stature and energy metabolism. Each cm. increase in stature calls for an added heat production of about 16.5 calories per day in men and 6.8 calories per day in women.

The minimum basal metabolism during rest varies in different individuals according to weight and area of body surface. In table 1 is recorded the gaseous exchanges of adult males per minute, and heat production in 24 hours during absolute muscular rest in a fasting condition. This table graphically shows the quantity of oxygen consumed, and the quantity of carbon dioxide excreted per kilogram of body weight per individual, and the calories consumed during the 24 hours and per kilogram of body weight per hour. The quantity of

TABLE I

GASEOUS EXCHANGE PER MINUTE, AND HEAT PRODUCTION IN TWENTY-FOUR HOURS, DURING ABSOLUTE MUSCULAR REST IN THE FASTING CONDITION[1]

							Per Kg.		Per Individual				
No.	Name	Age	Height (cm.)	Weight (kg.)	Expired Air	R. Q.	O_2 (c.c.)	CO_2 (c.c.)	O_2 (c.c.)	CO_2 (c.c.)	Calories in 24 hours	Calories per hour and kg.	Constitution
1	Rud	24	148	43.2	5.6	750	4.53	3.40	195.8	146.9	1,333	1.29	Very small and thin
2	Dr. Sch.	24	(?)	48.0	...	783	3.68	2.88	176.8	156.4	1,214	1.05	Small, thin, good muscles
3	L	30	153	50.8	5.9	826	3.73	3.08	189.4	182.8	1,315	1.08	Small, thin
4	Rutt	36	153	53.0	5.5	833	4.14	3.45	219.5	168.2	1,527	1.20	Poor in fat
5	W	56	170	56.5	...	766	3.93	2.98	222.0	188.0	1,519	1.11	Poor in fat
6	B	32	161	58.0	5.6	760	3.81	2.90	221.2	162.5	1,510	1.08	Normal
7	Dr. K.	(?)	172	64.0	...	...	...	2.94	.....	188.0	1,656	1.07	(?)
8	Prof. Z.	43	161	65.0	4.5	740	3.39	2.50	220.6	162.5	1,498	0.96	Normal
9	Dr. M. L.	25	167	67.5	5.2	830	3.43	2.86	231.3	192.5	1,608	0.99	Poor in fat; very muscular
10	Dr. L. Z.	22	167	67.5	...	865	3.43	2.97	231.3	200.2	1,621	1.00	Poor in fat; very muscular
11	Dr. J.	30	180	73.0	...	...	....	2.41	.....	175.6	1,584	0.905	Normal
12	Dr. Jaq.	34	170	82.0	...	788	2.76	2.17	226.3	178.3	1,556	0.79	Rich in fat, not corpulent; good muscles
13	Sp.	29	185	82.7	7.0	757	3.60	272	297.6?	225.4	2,030?	1.02	Poor in fat; very Muscular
14	Schm.	22	176	88.3	6.9	814	3.30	2.69	291.7?	237.4	2,019?	0.95	Normal fat; very Muscular

[1] From Metabolism and Practical Medicine, by von Noorden.

TABLE II

STANDARD BASAL METABOLISM AND HEAT PRODUCTION PER HOUR AND FOR 24 HOUR OBSERVATIONS (AFTER MEANS)

Subject	Date	Age	Weight, Kg.	Height, Cm.	Surface Area Square Meters (Linear Formula)	Percentage "Overweight"	CO_2 per Minute, c.c.+	O_2 per Minute, c.c.+	R. Q.	Pulse	Calories per Sq. M. and hr. (Linear Formula)	Calories per Kg. and 24 Hrs.	Total Calories per 24 Hrs. (Basal)	Standard Basal Metabolism for Age and Sex. Calories per Sq. M. and Hour	Percentage Deviation from Standard.	Remarks
Mrs. L. L.	8/ 4/15	36	145.3	163.5	2.79	105	227	324	0.70	79	32.6	15.0	2,185	36	— 9.4	
	10/ 6/15	..	144.5	.....	2.78†	...	230	343	0.69	74	34.7	16.0	2,315	..	— 3.6	
	10/11/15	..	141.5	.....	2.75†	...	226	326	0.69	73	33.3	15.5	2,200	..	— 7.5	
	10/16/15	..	139.0	.....	2.73†	...	219	301.5	0.70	66	31.0	14.6	2,035	..	—13.9	Started a complete fast today.
	10/17/15	..	139.0	.....	2.73†	...	209	314	0.67	70	32.3	15.2	2,120	..	—10.3§	Second day of complete fast.
	10/18/15	..	138.0	.....	2.72†	...	203	305	0.67	70	31.5	14.9	2,060	..	—12.5§	Third day of complete fast.
	10/20/15	..	137.5	.....	2.71†	...	205	309	0.66	73	32.0	15.2	2,085	..	—11.1§	
	11/13/15	..	133.8	.....	2.68†	...	217.5	298.5	0.73‡	68	31.5	15.2	2,030	..	12.5§	Has been on thyroid extract for last 5 days. Started at 3 grains and increased gradually to 12 grains per day.
	11/20/15	..	132.0	.....	2.66†	90	213	294	0.72	67	31.1	15.1	1,990	..	—13.6§	Has been on pituitary substance for last five days. Started at 8 grains and increased to 24 grains per day.
Subject's aver.	.....	..	.....	.....	....	...	...	...	0.69	..	32.7	15.3	....	..	— 9.2	
Mrs. McI.	1/ 7/16	46	127.0	157.5	2.29	95	203	299	0.68	65	36.7	15.9	2,020	34	+ 7.9	
Mrs. Sha.	11/ 4/15	30	113.0	155	2.21	80	184	283	0.65	68	36.1	16.9	1,910	36.5	— 1.1	
	11/14/15	..	107.5	.....	2.15†	...	190	249	0.76	68	33.0	15.8	1,705	..	— 9.6	
	11/26/15	..	106.5	.....	2.14†	...	195	254	0.77	68	33.9	16.3	1,740	..	— 7.1§	Has been on thyroid extract for last 5 days. Started at 1½ grain per day and increased up to 7½ grains per day. No food for 48 hours.
	12/17/15	..	102.0	.....	2.10†	60	168	250	0.67	66	33.5	16.4	1,685	..	— 8.2§	Has been on ovarian extract for last 5 days.

Subject's aver.	..	.....	.....	....	...	...	...	0.705	..	34.5	16.3	.....	..	— 5.5	Started at 2 grains, worked up to 16 grains per day.
Miss P. M..11/ 1/15	..	99	172	2.11	45	209	245	0.85	65	33.9	17.3	1,715	37	— 8.4	
Mr. Z. 12/ 1/15	30	98	167.5	1.99	50	272	278	0.98	..	40.7	20.5	2,010	38.5	+ 5.7	
H. S. (boy) 9/ 2/15	13	57.6	146.5	1.47	50	189	236	0.80	..	46.2	28.3	1,630	46	+ 0.8	
Mr. P. A. M.10/13/15	24	95	172.5	2.13	40	253	317	0.80	..	42.9	23.1	2,190	39	+10	
Mr. Ch. ... 9/16/15	54	102	178.5	2.145	30	...	282	....	..	37.9	19.1	1,950	35	+ 8.3	

* The figures for CO_2 and O_2 are in all cases the average of three consecutive ten-minute periods on the Benedict apparatus.
† Corrected from original determination on basis of 0.01 sq.m. per kg.
‡ It will be noted that in the case of Mrs. L. L., Mrs. I. and Mrs. Sha. the R. Q. is very low. This is undoubtedly due to the fact that these patients were on a very low carbohydrate intake.
§ Not included in averages.

carbon dioxide excreted is stated per kilogram of body weight and for the individual for the 24 hour period.

Table 2 worked out by Means [10] shows the standard basal metabolism for age, sex and calories per square meter of body surface: per kilogram, per hour, and for the 24 hours, and also shows the respiratory quotient per kilogram and per individual. This table also shows the basal metabolism of obese individuals, while table 1 worked out by Van Noorden [11] shows the respiratory quotient calories required in the 24 hours for normal and thin, poorly nourished individuals.

In table III are graphically arranged in parallel columns the figures given in tables I and II which were obtained by two different authors, and by two different methods, but which agrees very well, when certain anaylses in table I are excluded for the reason they are too high. The metabloic findings in this table are condensed from the 24 hour observations recorded in tables I and II.

TABLE III. THE MINIMAL BASAL METABOLISM IN TWENTY-FOUR HOURS.

Weight in Kilograms	Metabolism expressed in Calories for 24 hours For Normal individuals. According to Table I	For One Kilogram	Weight in Kilograms	Metabolism expressed in Calories for 24 hours For Obese patients. According to Table II	For One Kilogram
82.7	2.030	24.5	145.3	2.185	15.0
82.0	1.556	19.0	139.0	2.035	14.6
73.0	1.584	21.7	138.8	2.030	15.2
67.5	1.621	24.0	138.0	2.060	14.9
67.5	1.608	23.8	127.0	2.020	15.9
65.0	1.498	23.0	113.0	1.910	16.9
64.0	1.656	25.8	107.5	1.705	15.8
58.0	1.510	26.0	106.5	1.740	16.3
56.5	1.519	26.8	99.0	1.715	17.3
53.0	1.527	28.8	98.0	2.010	20.5
50.5	1.315	25.9	57.6	1.630	28.5
48.0	1.214	25.3	95.0	2.190	23.1
43.2	1.333	30.9	102.0	1.950	19.1

Practically constant values of 22 to 24 calories per kilograms of body weight are found for persons weighing from 43.2 to 82.7 kilograms. They drop to 15 calories in the case of obese individuals and rise to 30.9 calories in the cases of the lightest individuals observed. The total basal metabolism in a youth weighing 20 kilograms was only 30 per cent to 40 per cent higher than that of a man weighing only 40 kilograms. The metabolism is nearly proportional to the volume and vital energy of the muscles the mass and obese development of which increases the ratio of the superficial surface area of the body.

A careful comparison of the basal metabolism per unit of the body weights with the basal metabolism per unit of body surface will be found interesting. In table II is shown the heights in cm. weight in kilogram, total calories in 24 hours, and the calories per square meter of body surface in 24 hours. This law of surface area must therefore be held to apply to obese and thin subjects as well as to the so called normal individuals.

It is conceded that obese individuals have a greater metabolism than those of slighter build, still the metabolism does not increase in direct ratio to the weight, but less rapidly, while absolute metabolism does not run parallel with the body weight, still it is nearly proportional to the surface area of the body.

The basal metabolism of the obese has been repeatedly determined for comparison with that of the normal individual. When the metabolism per unit of body weight is used for comparison, the obese person will be found to have a lower metabolism. On the other hand, if the metabolism be reckoned from body height, the obese will be found to have a basal metabolism in excess of the normal, but if the metabolism per unit of surface area be used as a basis of comparison, the obese individual will be found to have a somewhat reduced basal metabolism when compared with that of the normal individual. Means is of the opinion that if the metabolism per unit of body surface be correctly estimated, the basal metabolism will not vary much from the normal. Therefore, it is pretty generally conceded that the basal metabolism is only very slightly lower than the lowest normal limits, and furthermore, a low basal metabolism cannot be an overwhelming factor for increasing body weight.

In obese individuals, the basal metabolism does fall considerably, and since fat tissues only, takes part to a limited degree in internal respiration, and we have no definite method of estimating the fat content of an individual, we can at last, only view the subject as "through a glass darkly." This is apparently true of the estimations of the various factors influencing the respiratory quotient.

The opinion is held by some observers, that in the obese the ingestion of food should call forth a slight increase of the gaseous exchange. However, up to the present, experiments on this subject are far from satisfactory, yet only the determination of caloric requirements has led to reliable information for guidance in this particular subject.

The obese individual, to whom every movement is attended with more or less disagreeable exertion, often gets along with a minimum of movement, but otherwise stands and sits as a normal individual. In normal adult persons, the ingestion of food rises or falls with the greater or lesser demands for alimentation, and the body weight, with slight changes, remains stationary year in and year out. This regulating mechanism is as yet little understood. However the appetite must be regarded as an important element, though at times we partake of much more food than the appetite really craves for, followed by a period of lessened desire for food, the cause of which is unknown. Therefore, if the diminution of the basal metabolism leads to increase of body weight, it would seem that the need for food does not keep pace with the exchange. Under such circum-

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Medical Provisions of Workmen's Compensation Laws*

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A study of workmen's compensation laws with particular reference to their medical provisions is productive of many interesting and, at times, astonishing facts. These laws have been administered largely by laymen who have had no extended experience or training either in law or medicine, and who are shifted with each political change in the state government. In general these laws have been patterned after a similar law in England and much of the phraseology has been borrowed from English sources.

The passage of compensation laws in 42 states—Arkansas, Florida, Mississippi, Missouri, North Carolina and South Carolina having no such laws at this time—nullified the provisions of employer's liability laws which had previously been in force. These older statues with their rights to action under the common law did not adequately safeguard the interests of the employee who suffered injury in his employment, and the compensation laws which displaced them were intended to put upon the employer the responsibility for the care of those injured in his employ and also to provide a definite measure of monetary benefit for the injured.

Enactment of compensation laws while in the nature of an experiment in social legislation has been productive of good to employers, employees and to society. The law's provisions whereby a portion of the burden of the injury is carried by the injured worker—compensation never having exceeded two-thirds of the worker's wage—make him realize this responsibility under the statute; and as employers are obligated to care for each injury occurring to workers while in their employ, both interested parties are generally agreed that the operation of the law is a distinct advance over the old liability statute which it displaced.

While marking a distinct advance in social legislation, these laws are not yet considered as finished products of the legislator's art, for practically at every legislative session each state amends its law in one way or another. Few of the states make sufficient appropriation to permit of any extended statistical analysis of their experience and such amendments as are made are brought about by influence of representatives of interested parties rather than by the dictates of past experience. At this time the tendency seems to be toward increasing the amount of cash benefits to be paid, reducing the waiting period, and removing the limits of time during which medical service is to be rendered and the amount of such service for which the employer is liable.

Every compensation case is a medical case, and under the law's provisions by far the largest number of these cases are entitled to receive only medical, surgical and hospital care. They are not of sufficient duration to entitle the workman to cash benefits. Yet in the administration of these laws we find that almost without exception they are administered by individuals without medical training.

It was my privilege recently to pursue a rather comprehensive study of the workmen's compensation laws of the United States with particular reference to their medical provisions for the National Industrial Conference Board of New York City. The results of this investigation have been published by this Board as Research Report No. 61, and for a more complete elaboration of the questions discussed in this paper, I would refer you to this report.

In only 15 of the 42 states having compensation laws is a physician attached to the administrative body in any other relation than that of an impartial or examining physician, except the state of Washington where a physician is chairman of the Medical Aid Board. With the exception just noted, none of the medical directors or advisors have administrative power; they can only express an opinion and make recommendations. Eight of the 15 states offer only a part time position to their medical directors. In Massachusetts, in addition to the medical director or advisor, there is a consulting board composed of two physicians designated by the Massachusetts Medical Society, two by the Massachusetts Homeopathic Society and three selected from the profession in the state at large. The duties of this consulting staff are to advise the board members and its medical advisor on problems that arise in connection with the administration of the law in that state.

The term "physician" is variously defined under these laws as one authorized to practice medicine in his state and in good professional standing. Other specifications are that he must be "duly qualified," "competent to treat the case," "a reputable practicing physician and surgeon," "a duly licensed physician," and "of good standing and ability." Educational qualifications of physicians entitled to treat compensation cases are mentioned in none of the laws.

The Wisconsin law provides "Christian Science treatment in lieu of medical treatment at the option of the employee but the employer may elect by filing written notice not to be subject to this provision." In Colorado, on proper showing to the Industrial Commission, an employee may be permitted to chose his own physician and in any non-surgical case he may, with such permission, resort to any non-medical treatment recognized by the state law as legal. In Colorado, chiropractors, chiropodists and Christian Science healers are all recognized. But in Massachusetts, the source of all the glorified wisdom for which Christian Science is noted, the Industrial Board heartlessly dismissed a claim for services rendered by a Christian Science practitioner, whose treatment consisted solely of prayer, on the grounds that prayer is a charge on the employer only when rendered under the section of the compensation act which provides for payment of funeral expenses.

In five states only, the injured workman has free choice of physician to attend him, while in two other states the employee may choose his physician from a panel submitted by the employer. In nine states a change of physician may be granted by the board upon proper showing, while in other states the employer is charged with the responsibility of furnishing the physician and the employee can select his physician only upon the employer's refusal, neglect or inability to do so. In five states negligence or mal-practice is compensated as

* Presented before the Society of Medical Jurisprudence, November 10, 1924, at the New York Academy of Medicine.

an aggravation of the original injury, and in four states the injured employee, in addition to receiving compensation benefits, may sue the attending physician for damage in mal-practice cases.

As an example of unusual consideration of medical questions in these laws, we find that anatomic descriptions in many of them are peculiar, to say the least. In the designation of the parts of the extremities for dismemberment purposes, in some laws the hand ends at the wrist while in others it extends to the elbow; the foot likewise extending to the ankle or the knee, the balance of the extremity being the arm or leg whose limitations vary in accordance with those noted for the hand or foot. In only one state, West Virginia, are the true anatomic divisions of the extremities noted in the law.

Another example of anatomic confusion is noted in the definition of what constitutes permanent total disability. Practically all of the laws contain this statement: Permanent total disability consists in the loss of both hands or both arms, or both feet or both legs, or both eyes, or any two thereof.

New Mexico is the only state in which the law provides that physical examination of workers previous to injury may be required by the employer. Practically all the laws make provision for examination and re-examination of injured workers to determine the extent of injury or progress toward recovery.

In only nine states are the commissions empowered by law to order autopsies in fatal injury cases. The commissions in three other states may require an autopsy under their general administrative authority.

Personal injury as defined in the law of 20 states does not include disease or infection unless resulting directly from the injury. In the other states all the other results of aggravation of latent diseases are compensated. Records of the commissions in this latter group are filled with cases where compensation has been granted at times for diseases that are far removed from any connection, except possibly a very remote one, with the original injury; but the precedent having once become established, it is extremely difficult for the administrative bodies to decide in any other manner. The following interesting quotation is taken from an opinion of the court in the case of Eldridge v. Endicott Johnson Co., 189 App. Div. 53. In affirming an award for anthrax infection, which it was granted might have occurred from a razor cut in a public barber shop, the court held that:

"The contracting of anthrax, consisting of the bite of the bacillus of anthrax, was an accidental injury within the meaning of the workmen's compensation law, and that said injury arose out of and in the course of employment."

In California and Kentucky by statutory provision and in Illinois by court decision, awards are apportioned when an active pre-existing disease is aggravated by an injury. In practically all other states the courts and commissions have ignored the pre-existing condition of the worker and have charged industry with the full effects of the injury.

In a Massachusetts case compensation was denied a claimant who had received a blow in the small of his back, later dying from carcinoma of the stomach. In another Massachusetts case, compensation was granted to the beneficiary of a truck driver who was thrown to the ground in a collision, although he was at the time admittedly fatally affected with cancer of the liver and whose death from this cause was only a matter of a short time.

Claims for compensation due to injuries sustained as a result of epileptic seizures, or caused by heart disease, or rupture of an aneurysm, or from apoplexy and similar conditions have been granted in many states. Latent syphilitic infection plays an important rôle in compensation cases in practically all states. Tuberculosis also has been regarded as of equal importance. Other diseases whose course may be dormant for considerable periods have also been regarded in a manner similar to those already cited.

Pennsylvania and Colorado have refused compensation for death from influenza while California has granted it in similar cases.

Michigan has granted compensation from pneumonia following back strain caused by heavy lifting, but has denied relief for the same disease in a fireman following exposure and a drenching while fighting a fire.

Wisconsin has granted and Minnesota has denied compensation for smallpox contracted under similar circumstances. Innumerable cases of the same character may be cited, but these are sufficient to point out the confusion due to such decisions which has arisen in the administration of these laws.

The principle of privileged communication has been abrogated or greatly modified by the provisions of the compensation laws. The law in practically all states stipulates that phyiscians who treat or examine claimants must upon request testify as to their findings before the commissions or courts. Probably without intention, but as the inevitable result of the enactment of these laws, a new element has been introduced into the relation of the physician to the community. The provision of all needed medical, surgical and hospital services for injured workers is made mandatory, the employer being charged with this responsibility and for the expense of such treatment. Obviously the employer, as such, cannot provide medical treatment and must call upon the physician for such service. Thus a new problem is introduced into the activities of the medical practitioner. As he is the only one in the community capable of rendering such service, there is imposed upon him, at least by implication, the duty of contributing of his skill and experience to the treatment of such cases. It has been suggested that physicians are under no greater responsibility to furnish services under the compensation law than they are under any other law. They may refuse to treat compensation cases, but once having accepted the responsibility of such treatment they become subject to the law's provision and thereby find their relations to their patients altered in some respects.

Fourteen states have adopted official fee schedules, and as with other features of these laws these schedules vary considerably, depending upon the locality to which they apply. The Utah schedules are as high or higher than in any other state. In a number of states without official schedules fees are limited to charges prevailing in the same community for similar treatment of persons of a like standard of living. In other states fees are fixed or regulated by the board, while under the laws of still other states the board has no jurisdiction over fees except in cases of dispute. The Texas law provides that the board should consider the increased security of payment afforded by the act when determining the reasonableness of fees.

Five states now have schedules of diseases for which compensation may be granted. As noted previously, several other states have interpreted their laws to include disease as well as injury. The laws of New York and Minnesota contain a list of more than 20 diseases and their sequelæ which are compensable. The Ohio law specifies 15 disease conditions, but omits reference to sequelæ. The New Jersey law, enacted by the last legislature, designates only ten diseases, also without reference to sequelæ. The law in Illinois applies only to poisoning by brass, lead and certain chemicals.

The granting of compensation for visual defects due to injury follows no fixed rule except in cases of loss of sight in the eye. No fewer than five schedules for estimating the degree of visual loss when tested by the Snellen chart are recognized and used among the states. These tables agree on but one thing: 20/20 equals normal vision. The New York law says that 20/40 is 50 per cent loss of vision, and 20/80, or the loss of binocular vision is industrial blindness. According to other tables 20/220 is regarded as industrial blindness.

Claims for hernia alleged to be due to occupation have been granted in increasing numbers. Some states have taken drastic measures to curb the tendency of workers with hernia, of long standing to sell them to employers. In these states the burden of proof that the hernia was acquired in the employment is placed upon the claimant.

There are many other interesting medical questions which might be discussed in connection with the administration of these laws, but sufficient evidence has been produced to show that constructive changes can be made in these laws which would result in a greater fairness to all interested parties. Taking the material which was assembled in the course of the investigation for the National Industrial Conference Board referred to previously, the Conference Board of Physicians in Industry —an organization of medical directors of large industrial corporations employing collectively over 400,000 workers and distributed throughout the principal industrial states—has for the past year been considering the formulation of a group of medical provisions to the compensation laws which it seemed to them would more justly fit the needs which these laws were designed to fulfill. The reason for these provisions has been discussed earlier in this paper. They are as follows:

MEDICAL PROVISIONS—WORKMEN'S COMPENSATION LAWS

Medical Director

There should be at least one member of the compensation board who is a physician and who would also act as medical director. He should be appointed from a group of at least three physicians proposed by the State Medical Society as being qualified for the position.

Consulting Staff

There should be a consulting staff of recognized specialists appointed from a group proposed by the State Medical Society to advise the board regarding the treatment of cases, the estimation of degree of defect and other matters touching upon medical questions. This consulting staff should be non-political and its members should be paid for the actual time spent in compensation work.

Examining Physician

Examining physicians should be appointed by the board after being recommended for the position by the consulting staff on the basis of their scientific qualifications. Such physicians should make examinations on injured workers on order of the board. Their fees and expenses should be paid by the board.

Definition of Physician

Only licensed graduates of recognized medical schools and in good professional standing should be permitted to treat compensation cases. Any other form of treatment should be given only under supervision of such physicians.

Medical Fees

Medical fee schedules, when adopted, should conform to the average charges for like work in the community. Where there is no official schedule and where the fee is in dispute, the board should be empowered to decide the matter.

Definition of Medical Aid

Medical treatment should include all necessary medical, surgical and hospital care and attendance and in addition such supplies and appliances as may be needed to relieve and cure the injured worker.

Physical Examination

Examination of the injured worker should be made immediately following the injury or at such time thereafter, on application of the employer or employeee, as the board or consulting staff determines to be necessary. Any expense to the worker of subsequent examinations should be borne by the party requesting the same.

Choice of Physician

Choice of physician should rest with the employer or be made by the employee from a representative group of physicians in the community provided by the employer. Employees should be granted a change of physician only on proper showing of employee or employer to the medical director of the board. Insurance companies should be permitted a change of physician only on proper showing to the medical director of the board.

Reports and Testimony of Physicians

Copies of findings of examinations by examining physicians should be furnished forthwith to all interested parties or their representatives.

Reports of physicians other than examining physicians appointed by the board who examine or treat compensation cases should not be sumbitted as evidence at hearings nor should such physicians be permitted to testify as to their examination or treatment unless medical representatives of the other interested party or parties have reasonable knowledge beforehand of the facts contained in the report to be made or of the testimony to be given.

Refusal of Treatment.

When an employee refuses further treatment by the attending physician or changes physicians voluntarily, the employer should not be held liable for further medical costs, compensation, or condition of the employee; but upon request and notice to the board should have the right to make an examination to determine the physical status of the injured at the time the change of physician takes place.

Amputation.

Anatomic limitations for amputation purposes should be as follows: hand, to wrist; forearm, wrist to elbow; arm, elbow to shoulders; foot, to ankle; leg, ankle to knee; thigh, knee to hip. Compensation for amputation of a member should be based on the function of the remaining part and not on the amount of tissue removed. The surgical "point of election" should be considered in all dismemberment cases.

Autopsy.

Provision should be made for autopsy in all fatal cases upon request of the employer, beneficiaries, or the Board; cost to be borne by the party requesting same. Refusal to permit autopsy when so requested should be a bar to compensation.

NOTE.—It is suggested that a toxiological examination of organs and tissues be made at time of making autopsy, whenever death is alleged to be due to a poisonous substance.

Disease Due to Accident.

Compensation for disease alleged to be due to an accident should be granted only on proof of the direct causal connection betwen the accident and onset of the disease.

Latent Disease.

Compensation for aggravation of latent or pre-existing disease should be limited to the degree of disability caused by the present employment or injury. Pre-existing condition or the result of previous occupations or accidents should be disregarded.

Vision.

The percentage of defective vision due to injury should be based on the age and occupation of the employee. Each case should be decided on its merits and not according to pre-determined schedule.

Hernia.

In order that the worker receive compensation for harnia alleged to be due to occupation, he should prove that

1. The herina was due to trauma or unusual effort.
2. It was accompanied by pain or swelling or nausea or other appropriate symptoms.
3. The herina immediately followed the trauma or unusual effort.
4. The facts were communicated to the employer within twenty-four hours.

Claims fulfilling above conditions should be offered operation, hospital expenses and, barring complications, compensation for not exceeding eight weeks. Refusal of operation, unless contra-indicated, should limit employer's liability to compensation for eight weeks only.

Occupational Disease.

Compensation should be granted for such diseases as are due to causes peculiar to the occupation of the worker or which may arise out of the employment as the result of an unexpected or unforeseen event connected therewith.

The opportunity for advancing the cause of public health and social welfare in its relation to the industries of our country rests largely upon physicians in industry and others interested in social and industrial problems. The Conference Board of Physicians realizes that the adoption of these provisions, either in whole or in part

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Organic Chemistry in the Hands of the Physician and the Lawyer*

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In addressing you tonight I will first speak of the meaning of organic chemistry to the medical man, what it may mean, and what it can mean. I will touch next on what I consider the post graduate school of organic chemistry, namely the use of it in industry, and by means of lantern slides take you to one of the plants and point out some of the relations of coal-tar products. Finally, I will speak of the work of lawyers in chemistry.

In taking my talk up in this order, I want to remind you of what some of you know already, that in the early days of chemistry the main work was to provide material for the physicians. A century or so later, the medical man and the chemist parted company, the former, about 1400 A.D., going over to mystery; the latter beginning the search for wealth. Down to as late as the middle of the last century, they were still far apart.

Go back to your days in the medical school. Nine-tenths of the medical students looked with impatience and dislike on the work they had to put in on chemistry. But in more recent years there has come a tremendous change. This, I think, is largely due to the work of Simon Flexner of the Rockefeller Foundation which has had a great influence in increasing the proportion of time given to chemistry in medical schools. That change did not come any too soon. Many doctors in their practice have found themselves wishing they knew more about organic chemistry, realizing the part it plays in the questions they had to puzzle over. Doctors have come to me for the opportunity to go back to the University and spend the summer on chemistry. That is natural if you think of the human body as made up of organic compounds of one kind or another, and that all changes taking place in this organism are primarily organic chemical reactions. It is, therefore, easy to see the importance of organic chemistry to the medical man. The body is a mass of organic compounds; when they are perfectly normal we have health; when they are abnormal we have disease.

So, the problem presents itself: Do we know enough about these changes; do we understand the processes of oxidation, or fermentation, taking place within the body. The question of metabolism comes up for consideration. Attention is now being paid to these questions in all medical schools.

But the question we want to take up tonight is, how can chemistry help further the work of the medical man.

One afternoon here in New York, coming back from a baseball game, Professor Bailey, Professor of Chemistry of the University of Texas, and I were waiting for a subway train. A thought suddenly struck me, and I said to him: "You make lots of chemical compounds. If you get a new substance that has probable therapeutic value, how can you test it out? What means have most of our organic chemists for such tests." He replied, "Practically none." I thought this very unfortunate. An editorial was written pointing out the importance of co-operative work in solving the chemistry problems of peace along the same lines which had proved so effective in war. This editorial drew forth much discussion and resulted finally in the appointment of a committee consisting of:

Dr. John J. Abel, Professor of Pharmacology, Johns Hopkins Medical School, Editor, Journal Pharmacology and Experimental Therapeutics; Dr. Carl L. Alsberg, Director, Food Research Institute, Stanford University, Calif.; Dr. Raymond F. Bacon, Director, Mellon Institute for Industrial Research, Pittsburgh, Pa.; Dr. F. R. Eldred, Chemical Consultant, Eli Lilly & Co., Indianapolis, Ind.; Dr. Reid Hunt, Professor of Pharmacology, Harvard Medical School; Dr. Treat B. Johnson, Professor of Organic Chemistry, Yale University; Dr. Julius Stieglitz, Chairman Department of Chemistry, University of Chicago; Dr. F. O. Taylor, Chief Chemist, Parke, Davis & Co., Detroit, Mich.; Dr. Charles H. Herty, Chairman.

This committee drafted a very interesting report on the relation of chemistry to medicine, intended for popular reading, and kept free from technical language, while every effort was made to have it scientifically accurate. One million copies of this report, "The Future Independence and Progress of American Medicine in the Age of Chemistry" were distributed by the Chemical Foundation. Many acknowledgements came to me. I was particuarly interested to note the number of letters I received from lawyers, expressing their keen interest.

The thought of the Committee was this. During the war, this country was called upon suddenly to solve the problems of the army and navy for offense and defense in gas warfare. How did they go about it? They called together the best talent available in this country, chemists particularly the organic chemists, physicists, pharmacologists and bacteriologists worked together under one roof and met in daily conference. Different types of minds and training were centering on one problem. The result was a speed in the advancement of research such as none of us ever dreamed was possible. And the problem was solved.

This is the thought that came out. Have we not learned a lesson from that experience of the concentration of scientific men on problems connected with the destruction of life,—is it not possible that we may see the day come when men of different types of mind can associate closely and work with the same zeal under the stimulus of saving life?

These problems connected with the body are chemical problems. Formerly medical problems had little assistance from the chemist. I find today a marked change. Dr. Abel of John Hopkins works with a chemist at his elbow. We have not struck the main road yet. How can the chemist work in these matters? First, I should say, in the preparation of specific medicinals. We know many cases of that kind. Take the discovery of salvarsan. Or the case of cocaine. There we have a substance made up of a complex molecule, of which only

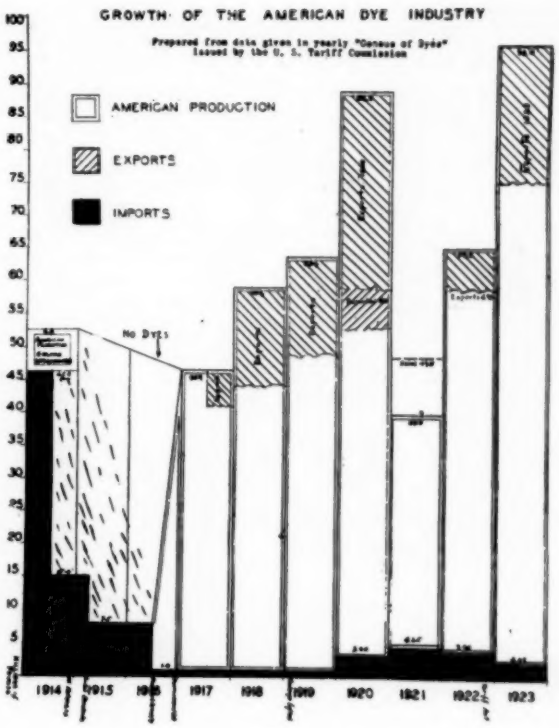
* Presented before the Society of Medical Jurisprudence on October 13, 1924, at the New York Academy of Medicine.

one part is of importance as an anesthetic. By careful work in organic chemistry Procain was developed, the valuable feature saved and the harmful features eliminated.

Here is another thought. Think of the years suffering humanity had to wait, during the 500 years which elapsed between the discovery of ether and its use as an anesthetic? Take the use of magnesium sulphate, in some ways known for many years—its powers. Then take quinin. There is a substance which by organic chemical work seems destined to give a product helpful in curing pneumonia. In another case the chemist can help the medical man through the isolation of pure principles. Take adrenalin in acute bronchial asthma. Think of the suffering of the past without the benefit of these substances. And also in those glands which control growth and play such an enormous rôle in other ways; what a tremendous field of activity lies there for study. Take the case of antitoxins. In most of the cases, what we are dealing with are certain specific chemical substances.

Some years ago I had occasion to go through a plant near the University of Toronto from which the sera which has saved so many lives comes on the market. I said to the director, "What are you doing here?" He said, "We are making sera." I said, "What exactly are you doing? You use that gray horse as a factory for producing a certain chemical compound, but he is making a lot of other things with it, so that your sera, no matter how carefully shipped out and distributed, may not fit one person as well as another on account of the substances which are mixed with it. May not the day come when, instead of an old horse, we will know what the chemical compound is in the sera which is needed and get it out, study its composition and structure and then be able to make that material so that doctors can use it in absolute safety?" He said, "We are a long way from that as yet." There are the lines waiting to be developed.

In the case of digestion, of metabolism—when you think of research, the chemist has to deal with the most complicated mechanism. No two people are alike; conditions are never the same. I wonder how medicine has gotten to the point it has. The fact that the problem is so complicated is all the more reason why we should get down to it as quickly as possible. I shall not take up your time to go too far into these questions which I can here discuss only in a very superficial way, but I do want to point out that the organic chemist deals with the complete ultimate analysis such as the constituents of body cells; the whole question of this is a tremendous field of research. Take the components of the blood, of the tissues, of food. When I think of the tremendous amount of money invested in the last seven years, and the brains utilized, in the manufacture of colors and then see how in comparison so little has been done in this enormous field that touches every man, woman and child in the country, it seems to me we have gone the wrong road. And yet, perhaps it is necessary, because this field of color, this dye industry developed in this country, is a post-graduate school for organic chemistry. If our professors are to do their best work in research they must have help. To get graduate men to work they must have a means of making a living after leaving the university for only a limited number can work in endowed institutions. They must find a livelihood in industry, and if the organic chemist can utilize the lessons received in the university to this end we will have a number of trained men who can be drawn upon to go on to the intensive problems in medicine.



I will tell you something about the synthetic chemical industry in America developed during the last eight years. It arose from an economic need. You will remember how during the war the prices of medicine shot up. The same was true in regard to the colors. It was practically impossible to get the colors. We were faced with a peculiar situation. The German Ambassador wired the Kaiser that if he would stop the shipment of dyes to this country it would throw four million men out of work. This was an exaggeration, but our mills were about to close when they said, "We have the dyes and are willing to send them to you, but we will not take money for them; we have to have cotton." Cotton was of course contraband of war. The loss of those tons of color was so important that our State Department actually made representation to the British government to lift the embargo on cotton. The British government knew that that cotton was meant for gun cotton and they rightly refused to lift the blockade, and that started the synthetic chemical industry in this country.

Then began a hustle to get out the products. A number of consumers got together in Washington and urged Congress to pass protective legislation. So it began, in a rough, crude way, but coming along. But the propaganda we had to go up against! The suggestion was made that American coal would not make good dyestuffs, which was ridiculous. That was the result of German propaganda. The next thing we heard was that American chemists did not have the brains to make dyestuffs. That emanated from the "supermen" overseas. The Germans had always dictated our tariff on dyestuffs, so they went about it again and worked down there in Washington while we were trying to make this country independent. There was the question of time; it was a race; could we keep protection long enough and get experience enough to hold our own. It is a wonderful story. Right over here on 41st Street Dr.

Bailey did some of the most beautiful work on luminal and other products the Bayer Company had patented in this country.

And so it went. Of course we were inexperienced. The greatest difficulty we had was getting capable support to take care of this industry until it was established. But we were not dealing simply with an economic question; we were not only building factories; we were training a personnel and developing plants that stood as part of the national equipment of war. President Wilson saw that, and in spite of his views on the tariff he cabled from Paris where the treaty was being drafted and called attention of Congress to the necessity of special care in fostering the organic chemical industry.

"Nevertheless, there are parts of our tariff system which need prompt attention. The experiences of war have made it plain that in some cases too great reliance on foreign supply is dangerous, and that in determining certain parts of our tariff policy domestic considerations must be borne in mind which are political as well as economic.

"Among the industries to which special consideration should be given is that of manufacture of dyestuffs and related chemicals. Our complete dependence upon German supplies before the war made the interruption of trade a cause of exceptional economic disturbance. The close relation between the manufacture of dyestuffs, on the one hand, and of explosives and poisonous gases on the other, moreover, has given the industry an exceptional significance and value.

"Although the United States will gladly and unhesitatingly join in the program of international disarmament it will, nevertheless, be a policy of obvious prudence to make certain of the successful maintenance of many strong and well equipped chemical plants. German chemical industry, with which we will be brought into competition, was and may well be again a thoroughly knit monopoly, capable of exercising a competition of a peculiarly insidious and dangerous kind."

President Harding wrote to Hon. Nicholas Longworth, dated August 10, 1921:

"Surely we would be both unmindful and unjust if we failed in a suitable protection of this industry until the new and complete tariff revision act is made effective."

Further testimony as to the value of this industry to the nation was given by Secretary Weeks, Secretary Denby, General Pershing, Senators Wadsworth, Jones of New Mexico, Ransdell, Lodge, Frelinghuysen, and others.

The opinion of Democrats and Republicans alike was that this country must never be without this industry, not only for economic welfare but because a number of chemists trained in this field is a protection to the nation. Every one of our dye plants has been surveyed by officials of the War Department and full details about them are on record in Washington today.

It seems peculiar that we should have had such a hard fight to take care of this industry. Many women have thoughtlessly imputed faults to our dyes which, although true in 1916, have now disappeared. Today we are furnishing over 96 per cent of domestic consumption of these products. I want to give you some idea, in the form of a chart, of the tremendous part domestic industry has played (D). Each year the price has come down until today, in spite of the fact that all labor is paid so much more, our consumers are getting dyestuffs as cheap as they did before the war.

(Throws a number of slides on the screen.)

So much for the industry which must be considered as a post-graduate school.

I want to take up now where the law comes into this question. One of the difficulties we had in developing this industry was the fact that there was a mass of compounds which were patented by foreigners under the protection of the Government and we could not make them. There was no intention of theirs ever being made here. Then came the seizure of alien properties, but these plants were no good without the use of the patents, so Congress amended the law and the Alien Property Custodian had the right to dispose of them as if they were his own. A large number of these patents were put up for sale, but it was realized that if we kept on selling them at public auction they could go back ultimately to the original owners. To avoid this, the Alien Property Custodian devised a plan to make those patents useful and there was developed the Chemical Foundation. That has been the most discussed public institution, and the most misrepresented because of the propaganda that has been out against it, but it has been the largest contributing factor in the successful upbuilding of this industry. Time after time the President of the Chemical Foundation, which is not a profit-making organization, for all of its resources go into education and research and the President does not receive any salary,—time after time the President has been before committees of Congress and been asked many, many questions. He has offered his cooperation if the Chairman of the Ways and Means Committee would suggest any improvement in the present methods. With all that ground so thoroughly covered there was nevertheless brought a suit by the United States Government to recover those patents. We asked President Harding to give us a hearing, because we felt we could save the Government and ourselves large sums of money by avoiding having the the case go to trial. Last summer, however, testimony was taken in the Federal Court, over a period of seven weeks. The Judge allowed everything to go into the record, which is of enormous length, and the arguments covered every conceivable point. A decision was rendered in which not only was the legality of the transfer upheld by the Court, but the President of the Chemical Foundation was commended for having kept the faith, and the Administration was rebuked for bringing the case to the court with such reckless charges and no evidence to substantiate them. And yet, in spite of this, that case has been appealed and will come up in November, in Philadelphia. I cannot understand why, when the case has been so thoroughly tried and such a verdict rendered in the Federal Court, this question should again be stirred up.

Meantime, the industry has gone forward, organic chemistry has been stimulated in this country and today a wonderful piece of work is being done by that organization.

Last year in the schools, prizes were given for work done in chemistry and very interesting essays were written in the public schools. Through this work of popularizing work in chemistry there is being established a sound public opinion among their parents and friends and the whole country is getting a real education in what chemistry can mean in the life of the nation. Backed by that public opinion you will find that chemistry in all its branches will grow and will be reflected in the work of the medical men. I noticed the account of the remarkable medical centre being proposed by the Presbyterian Hospital, and I am wondering if in the development of that idea whether there may not be, just as at Harvard and Johns Hopkins, the crystallization of the thought that real progress in these lines is not going to be met by physicians or chemists by themselves, but if they can be brought together with the physicists and pharmacologists and bacteriologists and have the opportunity to concentrate their efforts under favorable conditions of proper equipment and daily conferences, we can feel sure of the successful progress. My own belief is that we are right on the eve of a tremendous outgrowth in these lines. I think this altruistic

field is going to make a most direct appeal to people in this city. When you think of all the chemical problems connected with the human system that are awaiting solution I am sure that money will pour out in the future as fast as plans can develop through the advances we are making in synthetic organic chemistry and the development of the pure science of chemistry. In Pasteur France had a great genius. In Erhlich Germany had one. We may have such a man in this country. But we cannot afford to wait for geniuses; we can, however, take the best men and put them together, so we can hope for better progress than any one man of genius could make.

I hope you men of the medical profession will keep these general outlines in mind, and we chemists will be hand in hand with you for the good of the whole race. 1 Madison Avenue.

Discussion

Dr. Ernest E. Smith: In order to discuss a question there have to be two sides, and I am afraid Professor Herty has spoken so convincingly and with so much force that there is only one side to this question and so little opportunity to enter into any controversy or discussion. It is meet, however, that we should express our interest in this subject and our appreciation of it.

As Dr. Herty was speaking on the subject of cooperation of these different branches of science, chemistry, physics, pharmacology and biology as well as medicine, I was thinking how little we appreciate what it means to have these men co-operate. I was wondering if we appreciate the highly organized specialty of each of these men in their particular work. Not long ago I had the privilege of listening to a biologist present the subject of the exact measurement of life and death. Here is a piece of living material, and we have a mathematical expression of the life of that tissue under particular conditions. This was a new thought to me. The way the gentleman demonstrated this was to take a solution, put electrodes in it, connect them with a battery and put a recording instrument in the circuit. Thus he had an electric current of measured strength pass through the solution. Then he put a living membrane in that solution and it was found that when this living tissue was interposed between the two electrodes it offered a certain resistance to the current. That resistance existed, however, only so long as that tissue was alive, and as the tissue died that resistance diminished and at the point of death the resistance was only that of the solution in which it was immersed. In this way the life of the tissue was measured with a considerable degree of accuracy. That is a very special thing and one man has probably worked on that idea for ten years before developing it to the point where it is definite and means something. I cite it as an illustration of how a specialist may work on a subject to which most of us have given no thought. It is so highly specialized and so little generally known, and yet when it is applied to a special problem it means so much in finding out the facts.

I am sure we have all been inspired by the presentation this evening and will go away with more appreciation of the value of science, and of the efforts made to uphold the science and practice of synthetic organic chemistry in this country.

Dr. L. W. Zwisohn: My suggestion would be that this subject be spread before the public. not only as a matter to industry, but as a matter of life and death to every individual of the nation. Nothing can be accomplished by the medical profession unless the public helps and the opportunity should be given to them.

A. M. Nichol, Esq. Speaking only as an observer of organic chemistry in relation to foods I would like to ask if Dr. Herty considers that the use of synthetic essences in the flavors is of any significance in the health of the community. The very fact that the State has restricted the quantity of benzoate of soda for purposes of preserving foods and beverages suggests that the use of synthetic substances might have an injurious effect on the human body.

Victor House, Esq.: I think that there should be representation from the legal profession in the discussion, particularly since the Professor brought up the subject of the suit by the Government against the Chemical Foundation. I was on the fringe of the legal end of this matter, being associated with Colonel Anderson who prosecuted on behalf of the Government. The claim of the Government in that legislation was that in the sale of these various patents and rights to manufacture there had been insufficient consideration paid to the Government.

The answer of the Chemical Foundation was that it was in the nature of a charity which took over these rights and licensed the manufacturers. In practical effect the number of manufacturers has been limited. The people who received the initial licenses received the impetus regarding the start in those industries. Therefore, there are two sources of attack from the Government, for the Government got only a small fraction of the intrinsic worth. There may have been good cause for that, but the Government claims it was entitled to a larger sum of money. The other claim is that there was a restricted group of licensees who received licenses from the Chemical Foundation. I think it is a good thing to have this pass through the courts. I feel that the audience should not leave the hall with the implication that the Americanism and fidelity to duty of Henry W. Anderson, who prosecuted that suit, can be impugned. There are two sides to this question and it is a good thing that the transactions should be finally passed upon by the courts.

William R. A. Koehl, Esq.: I do not know how the legal profession can help this work of bringing about the co-operation suggested, but they may be useful in regard to litigation. The controversy suggested is for the courts to decide. It is simply a money question. It seems to me that there has been a development that has greatly benefited this country and the future of it is yet untold.

Professor Herty: In closing the discussion, I will reply first to the question regarding synthetic flavors. I think there is a little confusion in regard to this. There is just as much or as little harm in the synthetic as in the actual flavors, for they are the same. In sodium benzoate you are dealing with a preservative. But these flavors are natural flavors synthetized. In regard to the Federal suit against the Chemical Foundation, I would say I fully agree with the speaker that it is well for this to be thrashed out in the courts. It has been the football of politics and the President of the Foundation welcomed the day when testimony would be taken under oath. My argument was that the whole question was so thoroughly brought out in the trial last summer and the decision of the court was so clearly put that it seemed a waste of the tax payers' money in paying the legal expenses in carrying on the appeal and a waste of the Foundation's money to have to pay lawyers instead of encouraging education and research. The Foundation has never refused but one license and that because after application was made there was proof of merely a desire to do stock jobbing. You would be amazed to see how widespread the manufacturing is among the licensees. I would like to say further in connection with the prize essays offered to the school children, all were interested. The weak point was that none of the schools were supplied with popular books on chemistry, so we got a committee together and they picked out a list of books which could be recommended for reading and sets of these were delivered to the schools. Some of the money coming from the royalties on the patents was invested in these books, after arranging about copyrights and royalties. The Chemical Foundation donated last year 25,000 of these sets to the schools, and it has sold 10,000 to individuals at cost price. There have thus been put in schools all over this country: "The Life of Pasteur" by R. Vallery-Radot. "Discovery: The Spirit and Service of Science" by R. A. Gregory. "Creative Chemistry" by Edwin E. Slosson. "Riddle of the Rhine" by Lefebure. "Future Independence and Progress of American Medicine in the Age of Chemistry."

Yaws in California

Alderson reports the first case of yaws diagnosed in California. A Filipino, aged 27, a fireman on a steamer, presented verrucous and pustular lesions thickly scattered on his face, neck, chest and lower limbs. There was no evidence of syphilis. This eruption had first appeared in August, 1922, when he arrived in England as cook's helper on a ship. At that time it had been present on his face and head only, but it had soon spread to his trunk and legs. Some of the lesions had healed, leaving scars; some had developed into abscesses. He had received no treatment.

The present lesions were small, wartlike, papular lesions surmounted by yellowish crusts. There were several walnut-sized abscesses on the shoulders resembling gummas, which were painful. He had many pigmented, slightly depressed scars all over his body, produced by earlier lesions which had healed. The Filipino ship's cook, with whom he worked, had many similar lesions; he was the probable source of infection. There were no scars on the genitalia, and the patient said there had been no lesion there. He had general adenopathy. The blood Wassermann test was three plus. Pus from a lesion on his neck contained a large number of spirochaetae pertenues. He was given 0.6 gm. neoarsphenamin at once and 0.9 gm. three days later; in a week this dose was repeated. The last time he was seen he was apparently well. He did not return for examination. Two weeks later he wrote that he was well.—(*Cal. State J. Med.*, 21. 4.)

The Narcotic Question

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One of the most momentous questions before the people of this world is that of the control and regulation of the traffic in narcotic drugs.

It is a matter which must be viewed from three separate and distinct angles, the religious, the economic and the medical. The narcotic question is as old as religion itself. We have historical data to show us that in the most ancient of times opiates of various character were used in religious ceremonies. The chewing of leaves and the eating of nuts were employed to give the devotees strength and endurance in the various ceremonies dedicated to their numerous gods and goddesses.

The semiconscious and comatose conditions acquired by some of the priests and sooth-sayers were very evidently produced by the use of narcotic potions. Trance mediums of the present time in some countries are simply followers in the footsteps of some of these ancient personages. Even today some of the wonderful addresses of a religious nature, even among the leaders of our own refined religious bodies, will be found to have been written while the author was under the stimulation acquired by the use of some narcotic drug.

Taken from an economic standpoint, the narcotic evil is productive of more true harm and distress than any other condition known to civilized nations. Alcohol and its derivatives cause much misery, and are not much restrained by the Prohibition laws. But how much worse are the present laws and the manner of handling the narcotic question. The whiskey bootlegging business is nefarious in the extreme, but the unlawful and illegitimate traffic in drugs is truly appalling. The effects of the whiskey drinking habit are bad enough, but when a person comes in intimate contact with the user of narcotic drugs, he sees humanity at its lowest ebb. Absolute loss of self esteem, no regard for the truth, in fact, a human being with little more mind than an animal; little more mind except in one particular, and that is in the acquiring of a sufficient quantity of the special drug to keep him in a comfortable condition.

Has the drug addict any regard for his other friends? Only in so far as he can use them to further his means of securing his drug.

The habit is probably even more widespread among women than men. They forget themselves completely in their desire to obtain their dose. Appreciation of the difference between right and wrong, is lost completely. Any means of obtaining the drug will be used. Bodily harm is no draw back. They will sell the last thing they own, and then borrow or steal anything from anybody, which may be bartered for dope.

Even murder will be undertaken, without the least qualm of conscience, for conscience is an unknown word among these people. They lose all respect for themselves. They become unkempt and finally reach the lowest depths of degradation, becoming subjects of charity and filling our almshouses and insane institutions. From an economic standpoint the traffic produces hundreds of public charges, who take institutional places which might well be used for more deserving cases.

Why should the traffic in drugs be so widespread and so devastating? In a great measure because our laws are inadequate to handle the situation. And another reason is that this is a way for unscrupulous persons to make money easily and rapidly. The margin of profit to the large dealer is so great that he can afford to take a chance. The demand for the drugs is so widespread that the unscrupulous dealer can make his own prices, and so prey upon the unfortunate victims that they will pay his price, no matter what the personal sacrifice may be.

And a great many of the addicts are able for a long time to pay any price, for a goodly proportion of them come from the better class of the people.

From a medical standpoint is the traffic in narcotic drugs justified? I would answer this question rather guardedly. In its present extent it is most assuredly not justified. So long as the physician has to treat and the surgeon has to operate, there are going to be a certain number of cases who will require the use of opiates. At present I firmly believe that the use of narcotics is carried to a much greater length than necessary. The busy surgeon when he finishes an operation, will write upon the chart, Morphin, p.r.n. The nurse is a busy creature also, and in some cases may consider that the p.r.n. refers more to her needs than to those of the patient. Soon the patient begins to realize the amount of comfort which may be obtained during a rather monotonous season, and takes advantage of both the nurse and the orders of the doctor. When it comes time for the patient to return home, the physician cannot be at beck and call at all times, so prescribes a supply for the patient to use at discretion. Before anyone realizes the situation, the habit has been formed, and when once firmly entrenched, there seems to be no means of curbing the craving.

At other times the habit is formed by one person persuading another, or several others, to try some preparation, just for the excitement it will afford. Fashionable parties and gatherings in some places are not complete without their hypo or their snow for sniffing. Slumming parties and trips to Chinatown in our larger cities, are in some cases productive of much evil. The moving picture show and the cheap novel may be the starting point in some young person's down fall; and once started on the downward path the progress is rapid.

Finally, the question of treatment. This may well be considered under two headings: First, treating the disease, for I firmly believe the addict is a diseased person; and second, preventing the continuation of the present methods of acquiring narcotics. So far, all known methods of treating the addict have proven miserable failures, except for an occasional person who appears to obtain a new grasp upon life and its meaning. These cases are indeed rare. I have never come in contact with a person who has been an addict and has been cured. As to prevention of the formation of the habit, just so long as such products are to be obtained, there will be some persons who will abuse them.

Can prevention be a matter of local concerns? Absolutely no.

Can prevention be a matter of State control? The same reply.

Can prevention be a matter of national control? Again the same reply.

To my mind there is only one way to meet the situation, that is to grapple with the traffic at its source.

Place the growth and production of all narcotic preparations under international control.

Will this be an absolute preventive? No, but it will reduce the illegitimate traffic to such a low level, and make participation in it so dangerous that the reduction will be marked. It will reduce the population of our insane institutions and almshouses by about fifty per cent. It would place many a person upon a self supporting basis who otherwise would become a public charge.

The narcotic question is not so much one of treatment as it is of prevention.

Our present narcotic law as it is supposedly enforced in this country is doing almost as much, if not more harm, than it is doing good.

It is high time that some means of controlling this evil traffic should be worked out and put upon a practical basis.

Surgery

Treatment of Joint Injuries with Rivanol

The first case of a joint injury often decides the fate of the joint. This applies especially to those cases where there is a complicated dislocation. Lejars in his book "Dringliche operationen" gives the following advise to the practical physician: Reset the bone after cleaning the articular cavity, leave 1 or 2 drains in the united angle of the wound and put the joint in a position of rest. For the cleaning S. Loeber has recently found in rivanol a good antiseptic whose excellent action is shown in the following case:

On January 18, 1924, a 15 year old boy fell while practising gymnastics so hard on the right elbow that the entire humero-epiphysis after tearing off the inner epicondylus broke through the skin on the inner side of the elbow joint. The patient came under my treatment half hour after accident with a rotary dislocation of the forearm of 180°—the joint only wrapped with a woolen cloth. On the surface of the humerus joint there were woolen threads and some dirt. I immediately cut open the slit-like wound which was about 4 ccm. long, opened it up, covered the joint and the head of the humerus with a 1% rivanol solution, infiltrated the surroundings with rivanol, extirpated the broken epicondylus, reset the head of the humerus and closed the wound by an exact row of sutures. I put on a fenestrated bandage; after 8 days I began with moving it and left the bandage on the outside for 14 days more. The wound healed per primam. Patient can stretch the right arm at the elbow with complete freedom and move it as much as before the accident. If medical treatment is not obtained a short time after the accident then the practical doctor is advised as a first precaution in a complicated dislocation, to use rivanol solution before resetting. Schulz reported the Berliner Chirurgischen Gesellschaft for April 19, 1924, a case of traumatic opening of the knee joint which was healed per primam after washing with rivanol. The results with rivanol washing in joint empyema are well known; also I could recently obtain a swift disappearance of the cocci in a knee joint empyema after rivanol and obtained a cure without limitation of movement.—(*Deut. Med. Woch.*, July 4, 1924, 915.)

Sacral Nerve Block Anesthesia in Surgery of the Prostate Gland and Bladder

Judd and Meeker say that hemorrhage, shock, pyelonephritis, uremia and sepsis are the complications to be avoided in prostatectomy and resection of the bladder. Complications have greatly decreased in recent years owing to improved methods. In cases showing the usual complications of an enlarged prostrate or with a malignant bladder growth, local anesthesia is desirable. The authors at first tried periprostatic injections through the bladder by infiltrating the adbdominal wall of the bladder as for cystotomy. Next they utilized prostatic anesthesia by periprostatic injections through the peroneum. Later on they added pubic nerve block.

Experience showed that operative gentleness in the enucleation is an essential, lest the pulling on the parts be transmitted beyond the anesthetized area and thus cause intolerable pain. They believe that better anesthesia can be obtained by combining sacral anesthesia with direct infiltration through the bladder. They find a still more effective method is obtained by combining a low epidural injection for the fifth sacral and the anococcygeal nerves with the transsacral block of the upper four pairs of sacral nerves. The ordinary method is to inject from 20 to 25 cc. of 1% novocain adrenalin solution in the sacral canal, and this is followed by injection into the four posterolateral foramina on each side. The largest amount of solution is injected into the first foramen and the quantity reduced for the successive foramina, the amounts being 7, 6, 5 and 4 cc. respectively. For complete physiological block from 60 to 90 cc. of 10% solution are required. The authors employ 10 drops of adrenalin to each 100 cc. of the solution. Field block is used for the anesthesia of the suprapubic region. From 125 to 175 cc. of an 0.33% novocain solution are necessary.

In employing this form of anesthesia the authors had 62 primary prostatectomies and 15 secondary prostatectomies. The cases included primary prostatectomy, excision of the bladder diverticula, resection of bladder tumors, transvesical resection of bladder tumors, transperitoneal resection, cautery excision of bladder tumors, inoperable carcinoma of the bladder, explored, removal of bladder stones, etc. In 100 cases in which this form of anesthesia was used it was sufficient to conclude the operation in 93 cases. In the other seven, short inhalation narcosis was necessary. The postoperative mortality in the entire series was 3%. —(*J. Urol.*, 1924, XI, 395.)

Excised Duodenal Ulcers

The experience of William Carpenter MacCarty, Rochester, Minn., with 1,269 carcinomatous gastric ulcers, 832 simple chronic gastric ulcers, 425 excised duodenal ulcers and ninety-seven excised chronically inflamed (duodenitis) portions of the duodenum reveals the following facts: 1. Chronic gastric ulcers and duodenal ulcers are not infrequently multiple. 2. Chronic gastric ulcers are usually larger than chronic duodenal ulcers when seen at operative exploration; they have deeper craters with greater diameters. 3. Chronic gastric ulcers vary from 1 to 40 mm. in diameter, and doudenal ulcers vary from 1 to 25 mm. in diameter. 4. Chronic gastric ulcers vary from 1 to 20 mm. in depth, and excised duodenal ulcers vary from 1 to 5 mm. in depth. 5. All coats of the organic wall may be excavated in both gastric and duodenal ulcers. 6. Both types of ulcers may have their bases adherent to some neighboring organ. 7. In general, the relation of the diameter to the depth of the craters is such as to allow the generalization that duodenal ulcers are shallower than gastric ulcers. 8. There is less scar tissue in duodenal ulcers than in gastric ulcers. 9. Duodenal ulcers at necropsy, are usually shallow, having wide craters with sharp, thin edges; those which are excised during life resemble more closely gastric ulcers in shape, being, however usually much smaller. 10. The mucosa of the borders of gastric ulcers is usually hypertrophic and hanging over the crater; that of the duodenal ulcers is usually approximately the same thickness as the normal duodenal mucosa and does not project over the crater. 11. Postmortem changes are absent in excised ulcers. 12. Duodenal ulcers are usually in the anterior wall of the duodenum; gastric ulcers are usually in the lesser curvature or posterior wall. 13. The majority of the duodenal ulcers are in the first 5 cm. of the organ; they are sometimes found, however, in other portions, and have been found at the papilla of Vater with the opening of the common duct in the crater. This condition is usually associated with cirrhosis of the liver as a result of the partial occlusion of the duct. 14. There are no cytologic changes in duodenal tubules which suggest that carcinoma develops in them. In this series of 425 ulcers, no carcinomatous ulcers were found. During the same period of observation, three carcinomas of the duodenum were observed, but in no instance was there any apparent relation to an ulcer, such as is the case with gastric carcinoma and ulcer.—(*J. A. M. A.*, Dec. 13, 1924.)

Early Diagnosis of True Hernia of Diaphragm

It is the opinion of Donald P. Abbott, Chicago, that true hernias of the diaphragm, especially periesophageal, are much more common than is generally supposed. They are not found in the early stage because, owing to the fact that the sac is very small, the subjective symptoms are often slight. For the same reason, objectively, there are no findings on employing inspection, palpation, percussion and auscultation. The most important means of examination is fluoroscopic. Routine examination of the patient with the fluoroscope will reveal small periesophageal diaphragmatic hernias, which will otherwise be missed.—(*J. A. M. A.*, Dec. 13, 1924.)

The Physician's Library

Diseases of the Heart. By Prof. Henri Vaquez of the Faculty of Medicine of Paris. Translated by George F. Laidlaw, M.D., of New York. Philadelphia: W. B. Saunders Co., 1924.

The author is the outstanding cardiologist of Paris and his book appears at a time when the profession is giving particular attention to diseases of the heart. While it does not go into therapeutic details as minutely as one might desire, the volume is of particular value on account of the emphasis laid upon diagnostic methods.

Vaquez apparently feels that the urgent need of the general practitioner is the opportunity to improve himself in diagnosis. He gives very numerous references to current literature, both Continental and American. Taken by and the physician will find this book of practical value.

Dr. W. S. Thayer of Johns Hopkins presents a pleasant introduction.

How is Your Heart? Dr. S. Calvin Smith, M.D. 208 pages. Boni and Liveright, 1924.

As Vaquez's book was intended for the general practitioner, this small volume is for the laity. We fear, however, that parts of it will prove hard sledding for the non-medical mind. Indeed some of the material will do the layman little good. The physician who writes on such subjects for lay consumption too often finds himself on thin ice.

The author is very clever with his epigrams.

Materia Medica for Nurses. By A. L. Muirhead, M.D., and Edith P. Brodie, R.N. St. Louis: C. V. Mosby Co., 1924.

This book shows nurses how to assume some of the functions of physicians by telling how to prepare drugs for patients. If we are to educate nurses to be assistant physicians, the book will prove of great value in teaching materia medica. If nurses are to do nursing, the book goes too deeply into the subject to be of practical value.

Eat Your Way to Health. By Robert H. Rose, M.D. of New York Post Graduate Medical, New York. Funk & Wagnalls, 1924.

Those people who are anxious to reduce their weight should read this book. In the belief that right eating is the most important function we possess, Rose shows how to regain and keep health by use of proper food in proper amounts. If one would absorb all the excellent advice within these pages, following out the menus, one might go far toward adding to his span of life.

Concealed Tuberculosis. By George D. Head, M.D. Philadelphia: P. Blakiston's Sons & Co., 1924.

"The Tired Sickness," or "fag" indicates a beginning of tuberculosis, and the physician should exercise every particle of diagnostic ingenuity to get to the bottom of the trouble in patients, particularly between 20 and 30 who complain of fatigue. To be sure thryoid upsets and lues, and other conditions simulate tuberculosis in some symptoms, so that the physician must be most careful in his diagnosis.

Many cases are quoted, giving the reader a close up of some typical cases and adding materially to the value of the treatise.

Safe Guarding Children's Nerves. By Drs. James J. Walsh and Julius A. Foote. 272 pages. Philadelphia: J. B. Lippincott Co., 1924.

"How can I make my child eat and behave and do forty other necessary things," are answered here. The authors take the ordinary child, as well as the nervous child, the spoiled child, the misunderstood and the every other kind of a youngster, metaphorically dissect him, show us what makes the wheels go round and then put him together again. Result—a well-behaved child. Read it. It's worth while. Herbert Hoover approves it, as is indicated by the foreword he wrote.

Practice of Pediatrics. By Charles G. Kerley, M.D., and Gaylord W. Graves, M.D., of New York. 922 pages. Philadelphia and London: W. B. Saunders Co., 1924.

Dr. Graves, a Bellevue Hospital pediatrician, has revised the text of this splendid volume of which Dr. Kerley has put out two editions. Many additions and some subtractions have been made. The latest diagnostic aids and therapeutic measures have been described and the entire text is well illustrated, The authors' elaborate treatment of an important branch of medicine has produced a treatise of highest merit.

Fertility and Sterility in Human Marriages. By Drs. Edward Reynolds and Donald Macomber. 285 pages. Philadelphia and London: W. B. Saunders Co., 1925.

This is an enlightening dissertation on a subject of vital importance to society and to the future of the country. The authors present the determining causes of sterility in both male and female, advise as to marital habit, discuss the prevention, show physicians how to conduct a case clinically and all in all give us much valuable information on this question. Dr. E. L. Young, Jr., has contributed an interesting chapter.

Manual of Psychiatry. By Paul E. Bowers, M. D., Examiner in Lunacy, State of California. 365 pages. Philadelphia and London: W. B. Saunders Company, 1924.

The course in psychiatry in the average medical school is so brief that it behooves the practitioner to "bone up," when he gets into practice, particularly if he comes in contact with many mental cases. This book is excellently adapted for the purpose, as Bowers had the every day medical man in mind when he wrote it. He treats of the various mental disorders and psychoses, with methods of examination and treatment in 25 chapters. The book is as practical an exposition on the subject as will come to the physician's attention.

Manual of Obstetrics. By John Cooke Hirst, M. D. of the University of Pennsylvania. 551 pages. Philadelphia and London: W. B. Saunders Company, 1924.

The author's broad clinical and teaching experience has been drawn upon in the preparation of the nineteen chapters which go to make up this book. The result is a great success. He has compressed a tremendous amount of knowledge into small space and has then had the subject matter well illustrated.

This new edition contains much that did not appear in the 1919 edition, such as touch pictures in the various positions of the head involved in forceps deliveries. Hirst has gotten right down to hard pan and has left all unnecessary description to the writers of more ambitious text books.

His aim, in which he succeeds admirably, is to give the physician everything of a practical nature in obstetrics.

Physical Diagnosis. By W. D. Rose, M.D., St. Louis: C. V. Mosby Co., 1924.

This is the fourth edition in seven years, which amply tells the story of the book's reception by the profession. Naturally it cannot contain much new matter, but the volume is certainly up to date. Those who are looking for a practical book to aid in making periodic health examinations will find therein what they desire.

Pathology. By William D. MacCallum, M.D. 1,162 pages. Philadelphia and London: W. B. Saunders Co., 1924.

The favorable notice given previous editions of this splendid work can be extended to the third edition. Like other new editions, this book contains all that is new in the subject. MacCallum has handled it in masterly fashion and his book will long stand out as a beacon light in pathological literature.

International Clinics. 33 Series, Vol. IV, 34th Series, Vol. II. Philadelphia: J. B. Lippincott & Co., 1923-4.

The first of these useful books is devoted to a symposium of gastrointestinal theories. In addition it covers diagnosis and treatment, medicine, pediatrics, obstetrics, surgery, and it also contains the Alvarenga Prize Essay of the Philadelphia College Physicians for 1924 of Dr. Heller of Kansas City.

The other volume presents a symposium on physiotherapy and gives considerable space to surgery, diagnosis, neurology and pediatrics.

One of the outstanding articles in this volume is that on Caudal Anesthesia in Urology by W. H. Haines of the University of Pennsylvania. He presents a new method for locating the sacral hiatus and shows how novocain can best be utilized. The various articles are of definite value to the clinician.

On the Action of Bismuth Preparations on the Syphilitic Organisms

Neuber reports experiments with various German and French preparations on all stages of syphilis. He came to the conclusion that bismuth alone is useless in the abortive treatment although a compound which contains mercury seems to be suitable for all stages although it is not superior to salvarsan. A combination of salvarsan and bismuth is best. It is poorer in its action on the serological reaction than mercury as all authors have shown. It is best suited for those cases in which salvarsan and mercury treatment is contraindicated. The after effects are appreciably slighter and more harmless than with salvarsan and mercury.—(*Derm. Woch.*, 1924, lxviii, 185 and 237.)

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Re-registration

Henry L. Mencken, the severest critic of the American scene, has pointed out the astounding susceptibility of the Anglo-Saxon type of man to fears and alarms. He calls it hereditary cowardice. The Anglo-Saxon is prone to fall into a panic at the first threat of genuine danger. Mencken gives a number of telling instances, among which are the following:

"Who remembers that, during the Spanish War, the whole Atlantic Coast trembled in fear of the Spaniards' feeble fleet—that all New England had hysterics every time a strange coal-barge was sighted on the sky-line, that the safe-deposit boxes of Boston were emptied and their contents transferred to Worcester, and that the Navy had to organize a patrol to save the coast towns from depopulation? . . . During the World War the entire country went wild with fear of an enemy who, without the aid of divine intervention, obviously could not strike it a blow at all. . . . This reluctance for desperate chances and hard odds, so obvious in the military record of the English-speaking nations, is also conspicuous in times of peace. . . . The normal American of the 'pure-blooded' majority goes to rest every night with an uneasy feeling that there is a burglar under the bed, and he gets up every morning with a sickening fear that his underwear has been stolen. . . . They lack the ease and tolerance, the fine adventurousness and love of hazard which go with a sense of firm security—in other words, with a sense of genuine superiority. . . . The most elementary facts about the visible universe alarm him, and incite him to put them down. Educate him, make a professor of him, teach him how to express his soul, and he still remains palpably third-rate. He fears ideas almost more cravenly than he fears men. . . . The success of these so-called Anglo-Saxons in the world, I am convinced, has been due, not so much to their merits but to their defects—and especially to their high capacity for being alarmed and their aversion to what may be called romance—in other words, to their harshly practical minds, their disdain of intellectual enterprise, their dull common sense. They have saved their hides and their money while better sportsmen were taking chances."

Mr. Mencken is at great pains to point out the ignoble side of this susceptibility to alarms, but it also serves very useful purposes. Just at present the fears of a large number of physicians in New York State are aroused over the threat of annual re-registration, and certain gentlemen who are extremely adept at intensifying such fears are doing very useful service. If nothing short of a panic will serve to prevent the putting into force of such a measure as re-registration then let us be as panicky as our Anglo-Saxon susceptibility to fears will permit.

We strongly suspect that what Mr. Mencken calls our "hereditary cowardice" is really a kind of smoke screen employed to disguise our "harshly practical minds" and our "dull common sense." He admits that our success goes along with the display of this quality. This being so, we have a hunch that the degree of panic over the proposed re-registration presages a hugely successful resistance against the forces that are attempting to place yokes upon our devoted necks.

If this be cowardice, then we confess to a very deep streak of yellow.

And we seem to remember that both the wars mentioned by Mr. Mencken were won by us.

New York: Supreme Medical Centre

On January 31 ground was broken for the great medical centre of which the Presbyterian Hospital and the Columbia University Medical School will constitute the nuclei.

Such a centre will do much to enhance the place of New York as the medical centre of the United States and as the true metropolis of the world.

In the words of Dr. Haven Emerson, "The medical centre of New York will be a symbol of the new community conception of medical service. The patient will be considered as an individual, not a mere accidental collection of special organs and tissues, not a case of disease but a personality for whom every resource will be available."

Grober, the University of Jena authority on hospital construction, has declared "this wonderful work" to be "one of the greatest in the civilized world."

But, as we pointed out in our issue of March, 1919, one of the most important foundations upon which a medical centre must rest is the medical press. It will not do merely to have great colleges, hospitals, learned societies and libraries if there is no medical press commensurate with them in distinction.

What we said in the editorial alluded to will bear repetition:

"It rests with the leading men of this centre to maintain its prestige, if they care about it and their own personal fortunes. This means loyalty to the journals best representing the high tone of the profession, quite as much as notable teaching or any other distinguished activity. Otherwise, what shall be justly said of an alleged centre whose medical press is not upon the same plane as its hospitals and clinics and laboratories and the best minds of the profession itself?"

It yet remains for New York to wrest journalistic laurels from Chicago. This will prove to be the mightiest of the labors of the Manhattan Hercules of Medicine.

Preserved Foods and Cancer

Canned foods do not appear to lack defenders on the score of vitamin content. Kohman, in the *Journal of the American Medical Association* (Jan. 17, 1925), speaks of the recent findings that canned vegetables are much richer in antiscorbutic vitamin than the same vegetables when purchased raw in the city market, and home cooked. This is ascribed to the fact that vegetables are canned in a fresher state than they can be purchased raw in the city market. Moreover, the canned vegetables are cooked in hermetically sealed containers and therefore in the absence of oxygen, which is the big destructive factor in cooking.

Kohman states that canned tomatoes have been reported by a number of investigators as rich as raw tomatoes in antiscorbutic vitamin. Raw spinach, after canning, is equal to canned tomatoes as regards vitamin C content, and nearly equal to orange juice.

Canned cabbage is rich in antiscorbutic vitamin. No vitamin C is lost in the canning of apples, and canned apples maintain their vitamin content better than apples held in cold storage.

Kohman concludes that canned vegetables are one of the richest sources of antiscorbutic vitamin, and that there is no evidence that the vitamin deteriorates. Actually, the evidence appears to show that there is no deterioration.

Milk can be so dried to-day that the vitamin C potency is preserved.

It would seem that the use of preserved foods, in so far as the vitamin content is concerned, cannot play so great a part nowadays in laying the foundation for such diseases as cancer, as J. Ellis Barker would have it that they do ("Cancer: How it is Caused; How it can be Prevented").

An Underestimated Aftermath

Tonsillectomy has no specific effect with respect to impotence, of which it has been rather naively suspected to be a cause. Our own observations incline us to believe that operations under local anesthesia of any kind, the patient being conscious, tend to inflict varying degrees of psychic shock the effects of which are occasionally longer lasting than we have hitherto supposed. We underestimate the degree of such shock and we fail almost utterly to evaluate the significance of surgical neurasthenia and low blood pressure months after the operative intervention. The symptom-complex suggests that following influenza.

We have been impressed particularly by such effects in the case of men at that period of life which our French colleagues, especially, correlate with the menopause in women, and in other males whose reserve powers are not what they appear superficially to be; then there is a class of men whose blood pressure at the best is of the minimum type who tend to show late effects of the sort under discussion. These things should be taken into some consideration when operations like tonsillectomy are undertaken.

The late fatigue, digestive disturbances, headache, sexual weakness, malnutrition and low blood pressure which seem to be the hall marks of this type of post-operative exhaustion are best combated by rest, recreation, change of environment, and medication addressed to a correction of the ductless-gland depression; strychnin, caffein in the form of either coffee or the alkaloid itself, pituitary and suprarenal substance, and small doses of thyroid extract make an effective combination. Tobacco in moderation is not contraindicated. Active exercise is best abstained from. Hot baths are decidedly harmful.

Most of these cases are not checked up and the symptoms and signs are not always associated, as consequences, with the original cause by the practitioners who deal with them.

Miscellany

Conducted by Arthur C. Jacobson, M.D.

The Doctor of the Future

No figure in the life of country districts and smaller communities has more endeared himself than the "doctor of the old school." The Weelum McClure of Ian MacLaren's stories has had many living counterparts in America—the general practitioner at his best, resourceful, a friend and counselor as well as physician. Seventy-five per cent. of our population are still treated by general practitioners with limited technical appliances, little or no specialization of skill, and but a slight relation to medical services organized in hospitals, dispensaries and clinics. This is the estimate of Dr. George E. Vincent, President of the Rockefeller Foundation, who spoke in Kansas City at the second annual meeting of the American Child Health Association. He said that the problem of the American doctor of the future comes largely down to this: "Can the general practitioner be reproduced on a high level of efficiency and can he survive under the conditions which he is likely to face?"

Many assert that his opportunities are being constantly restricted so that he will not hereafter be able to gain social esteem or even earn a livelihood. Dr. Vincent's answer is that the underlying American philosophy of individualism finds embodiment in the general practitioner and will not let him go. It will still have need of him as a "counselor of health." Even after environment has been "sanitated" and communicable diseases have been subjected to public control and become rare, as, for example, typhoid fever in some areas; even though the specialist has pre-empted certain anatomical territories and pathogenic states, and the growth of institutional and preventive medicine has encroached upon the fields of curative medicine, there still remains a need for the general practitioner which no specialist or hospital can fully satisfy. He is characterized by Dr. Vincent in this way:

The well-trained, properly equipped, experienced general practitioner of ability, character, personality is a fundamentally valuable person. He is a good diagnostician. He sees his patient as a whole. He knows his peculiarities and circumstances. He can decide when to refer him to a specialist and when to protect him against the very real danger which is threatened by a narrowly specialist point of view.

He may hope to survive only if he will "submit to a measure of organization and team-play in the cooperative use of laboratories and other resources," and especially if he will become a "practitioner of preventive medicine." To this end he will need a different sort of training and must assume a different attitude. He must give more attention to diet, exercise, mental attitudes, recreation, family and social life. His chief function will be that of trying to keep his patients in health and of knowing where to send them in case of accident

or illness. This, of course, will require a change in the people also, for they must come to think of keeping their physical and mental machines in order, instead of awaiting break-downs and blow-outs and then making belated and expensive repairs. The day may come, says Dr. Vincent, when men will treat their bodies almost as wisely as they do their motor cars.—*New York Times.*

The Dogs of Nome

Again, in a crisis, man turns to his faithful friend—the dog. Out on the snow and ice of Alaska, dog teams, twenty-one strong, are dashing at their utmost speed toward Nome, seven hundred miles away, with diptheria serum to save the lives of eleven thousand people.

Airplanes? "They know what the dogs will do, but they do not know what will happen to airplanes." They know that the dogs will mush on until they fall—that other dogs will take the places of the fallen, and mush on—for that is the way with dogs in that land of snow and ice.

More than the genius of invention, and quite as much as the ingenuity of man, the dogs of Alaska have fought for the redemption of that rich empire from the wilderness. They have carried food to the hungry, clothing to the cold, letters to the homesick, assistance to the sick—but never have they served more spectacularly than they are serving to-day as they dash through a temperature of 60 degrees below zero, over seven hundred frozen miles, to save the lives of eleven thousand people.

And in the end they will get a piece of bacon and a pat!

"The dogs of Nome that raced with the 'Black Death' in 1925"—give them a monument at least.

But Balto Mushed On

The life-saving serum has reached Nome, after a record race over the snow and ice, against a furious Arctic wind—because of the fidelity and wisdom of dogs.

In the face of the blizzard the airplane failed—it could not fight the storm.

But on mushed man and dogs—an elemental picture outlined against a white, cold world.

And then man failed—for the trail was lost in the snow.

But Balto, stout-hearted, faithful leader of the canine heroes, smelled the lost trail through the snow—and mushed on.

The airplane failed. At length man failed and the fate of Nome rested with a dog.

But Balto, the dog, did not fail—and there is serum to-day in Nome.

Balto—the Malamute—and his fellow dogs, half frozen, half starved—these are the heroes of the race against the Black Death.—*Evening World,* Jan. 30-Feb. 4, 1925.

British Comment on Bootleg

In America, bootleg whisky is sold in glass-stoppered bottles. It has been found that it eats away ordinary corks.—*Punch* (London).

"Come over here and meet Mr. Smith, the great Russian expert," said a friend.

"What is a Russian expert?" we asked.

"Well, he went to Russia and came back alive," explained the friend.—*Kansas City Star.*

Sulpharsphenamine

(Concluded from page 63)

(1) Intravenous. Edema and local burning, local cellulitis in one case where leakage into surrounding tissues occurred, subsided in two or three days.

(2) Intramuscular. Occasional induration with slight tenderness for two or three days.

(3 Subcutaneous. Infrequent slight redness and induration for two or three days following injection."

6. "0.6 gm. intravenously. Reactions—one death,* 35 minutes after having received injection. Died while in convulsions, having had them on two previous occasions. No trace of embolism was found at autopsy, the pathological findings being:

1. General arterio-sclerosis (cerebral, aortic and coronary).
2. Slight anuerysmal dilation of aorta.
3. Chronic nephritis with atrophy of left kidney.
4. Fatty liver.
5. Acute congestion of lungs and spleen.
6. Atrophy of brain convolutions.
7. Old intestinal adhesions.
8. Hypertrophy of prostate.
9. Varices of legs."

7. "Without being able to judge as yet which is best I have used the intramuscular method most (buttocks). Reactions if any are occasional, slight rise of temperature in a few cases afternoons following morning treatments at weekly intervals. Local results at sites of injection good in most cases, with no serious local reactions. Report of a case giving evidence of toxic symptoms—M. A. S., patient, female, age 45, with advanced neurological abnormalities, positive spinal fluid and blood Wassermanns had previously reacted poorly to intramuscular mercury, received three weekly intramuscular injections of sulpharsphenamine, the first of 0.3 gm., second 0.6 gm., with fair general reactions. Following the third injection, symptoms of nausea occurred followed by vomiting; complained of sharp sticking pains all over; loose bowel movements. Present symptoms more pronounced the next day. On the third day a generalized maculopapular rash appeared on body, extremities and neck, extending to the face. Temperature present and went as high as 101.2°, pulse 100, respiration 24. Albumin found in urine, though negative before treatment. Edema of eyelids and feet present. Much of the rash became confluent and as it began to disappear on the fourth day it appeared as irregular, often semicircular patches and completely disappeared on the seventh day. Treatment discontinued because of intolerance, this probably being due to faulty elimination. Beneficial effects have apparently been obtained in most cases."

Conclusions

That sulpharsphenamine is a safe and reliable drug to use in the treatment of syphilis and the drug of choice especially for the general practitioner.

That the route, whether subcutaneous, intramuscular or intravenous, is of apparently little importance therapeutically.

That some pain and inconvenience is apt to be associated with the local injections; this is minimized if not altogether prevented by not using more than 0.3 gm in 0.9 cc of water and injected subcutaneously into the loose connective tissue or epifascially.

That children take the treatment locally without reactions or pain.

That its so-called penetrative powers are probably correct, based upon the observation of cases treated in the state hospitals, all of them having nervous system involvement usually to a chronic degree and a larger number exhibiting negative Wassermanns than under former methods.

That reactions of even a severe nature sometimes occur but not as frequently as with arsphenamine or neoarsphenamine.

The patient should have the same preparation as for the other arsphenamines, i. e. previous administration

*A second death has occurred, a private patient of a clinician. The patient had four previous treatments and was receiving the fifth when he exhibited symptoms of shock and died in spite of restorative treatment. Cardiac involvement was discovered at the post mortem.

of a laxative and abstinence from food for at least a few hours before treatment.†

†These observations were conducted mainly while Venereal Disease Control Officer of the Massachusetts Department of Public Health and the writer wishes to thank the chiefs of the clinics and the superintendents of the state hospitals for their cooperation and assistance in evaluating this preparation.

Basal Metabolism

(Concluded from page 68)

stances the diminution of the basal metabolism is less to blame for the increased body weight, than to a disturbance of the regulating mechanism, moreover, it is possible that there are forms of endogenous obesity in which the basal metabolism is not lowered.

According to this method of reasoning, in exogenous obesity, the regulatory mechanism may be voluntarily disturbed on account of bad dietetic habits, while in endogenous obesity, involuntary disturbances upset the team work of the factors governing assimilation.

Conclusions

(a) The respiratory quotient is an index of the kind of food stuffs undergoing combusion in the body.

(b) Normal basal metabolism is a fairly constant factor, but has wide variations in diseased conditions.

(c) Basal metabolism furnishes a more definite conception of the food requirements in diseased conditions than any other factor.

(d) A marked rise of basal metabolism is always found in hyperthyroisism.

(e) A marked fall in basal metabolism always occurs in hypothyroidism.

(f) Enormously obese patients may be found to have a normal basal metabolism.

(g) In simple obesity there is no change in the basal metabolism.

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REFERENCES.

1. Means, J. H. Boston Med. & Surg'l Jl. Vol. CLXXIV, No. 24.
2. Fitch, W. E. Dietotheraly Vol. 1, D. Appleton & Co., 2nd Ed., 1923.
3. Means, J. H. Boston Med. & Surg'l Jl., Vol. CLXXIV, No. 24.
4. Lusk, G. Jl. Biological Chemistry, Baltimore, 1915, XX-535.
5. Murlin John R. Endicronology and Metabolism, Vol. 3, page 594. D. Appleton & Co.
6. DuBois & DuBois, Archiv. of Int. Med., 17 p. 863, July, 1916.
7. Means, J. H. Jl. Biological Chem. Vol. 21, page 263, 1915.
8. DuBois, E. F. et al, Series of papers on Clin. Calorimetry, Archiv. Int. Med. 15, p. 793, July, 1915.
9. Harris, J. A. & Benedict, F. G. Carnegie Institution of Washington, Pub. No. 279, 1919.
10. Means, J. H. Archives of Int. Med. Vol. XVII p. 704, May, 1916.
11. Von Noorden, Metabolism and Practical Medicine, Vol. 2, 1907.

Workmen's Compensation

(Concluded from page 71)

will depend in the greatest measure upon the interest and cooperation of other interested groups. The provisions have been drawn without reference to existing laws and doubtless their adoption in some states would necessitate a considerable amendment to the laws now in force. I believe we can all agree that if they were adopted they would more nearly serve the ends of justice and fair dealing to all interested parties, and it is only a question of time until such adjustment will be forced upon us. The longer it is delayed, the greater will be the accumulation of precedents established by commission and court rulings and the harder it will be to overrule these in the application of newer methods. The problem is largely one of education of industrial boards, of employees and their organizations, of employers and their organizations, and of legislators. The assistance of such bodies as this in making constructive criticism of the proposed problems will be welcomed. It is a work in which the entire medical profession has a vital interest and merits its earnest consideration.

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Syphilis

Nonspecific Protein Therapy in Syphilis

Nonspecific protein therapy has proved of value according to Greenbaum and Wright in the treatment of acute infections such as typhoid fever, anthrax, diphtheria, erysipelas, pneumonia, scarlet fever, small-pox, typhus fever and septicemia; in arthritis, in gonorrhea and its complications; in various dermatologic conditions including psoriasis, exfoliative dermatitis, furunculosis, eczema, etc., in diseases of the eye, such as uveitis, panophthalmitis, iritis, pneumococcic corneal ulcers and keratitis; and in such miscellaneous conditions as angioneurotic edema, secondary anemia and disorders of the blood, such as purpura. Unfavorable data on the effects of intramuscular nonspecific protein injections in Wassermann fast cases were altered by the work of Kryle who published his results in the Wien. klin. Wschr. in 1917.

The procedure of the authors consisted in a preliminary course of 6 intramuscular injections of a 4 per cent sterile suspension of milk protein given at intervals of from two to three days. The injections were made in the gluteal muscle. A surprising symptomatic cure of multiple ulcerating lesions suggesting a thorough examination of the effects and value of non-specific protein stimulation in conjunction with the usual anti-syphilitic drugs. No primary cases were included in this group. The case histories are given. The comment of the authors is as follows:

"While the series of cases is not large, it suffices to show that non-specific protein therapy favorably influences the course of syphilis. In what manner it exerts this favorable influence or what value it has in the treatment of syphilis, we are, at present, not prepared to say.

"We desire to emphasize that it is not our purpose to intimate that injections of foreign protein are in any way a cure for syphilis. Our experience, however, would indicate that there is a definite influence, in chronic syphilis at least, appears to be a favorable one. If the effect of the injections is to stimulate the natural protective forces of the body, the use of non-specific protein therapy as an adjunct to specific therapy may be of decided value."—(*Arch. Derm. & Syph.*, Nov., 1924, 551.)

Milk Injections in the Treatment of General Paralysis

Experiments have been carried out in the psychiatric clinic of Moravcsik. M. states that, in view of the results obtained, milk is the most efficacious of the nonspecific remedies, and that the results of milk injections were much superior to those obtained by antisyphilitic treatment in general paralysis of the insane. The explanation, which is at present only theoretical, is that the efficacy of the treatment is due to leucocytosis, activation of the protoplasm, stimulation of antibody forming elements, increased transfusion, and hyperemia in the diseased foci.—(*Lancet*, London, 1921, I, 1231.)

Grape Sugar Solution for the Intravenous Injection of Salvarsan and Dispargen

H. Weitgasser at first used a 50% grape sugar solution as vehicle for his salvarsan injections. By the addition of the grape sugar the action of the salvarsan is increased on the one hand, and on the other, its toxic action is clearly lessened, so that the use of grape sugar as a solution medium seems to be indicated in all cases where salvarsan alone is poorly tolerated or where the patient is weak and emaciated. in gonorrheal complications the author tried a grape sugar dispargen mixture. Here also, the toxicity of the dispargen, as regards its irritating components was lessened and the therapeutic action was increased in accordance with the hypertonic properties of grape sugar.—(*Med. Klin.* 1924 xx 113.)

The Complete Usage of the Early Change of Healing in Acquired and Congenital Syphilis

As opposed to the tendency in syphilis to turn back more or less completely to the chronic intermittent treatment, Hoffmann and Hoffman recommend their well-known standpoint. Maximal early treatment (the highest possible single and total doses of salvarsan combined with Hg or Bi given at short intervals. One course with seronagative primary lues, two courses with seropositive primary lues and fresh secondary and three courses for older syphilis), further usage of all means to insure an early diagnosis, and after discontinuation of treatment careful observation. With symptomless infants of syphilitic mothers careful early treatment is advised even without a definite diagnosis.—(*Muench. med. Wschr.* 1923. lxx, 626.)